ANNUAL MEETING: LIVERPOOL AND SOUTHPORT, JULY 13–21, 1950

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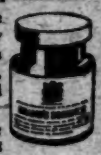

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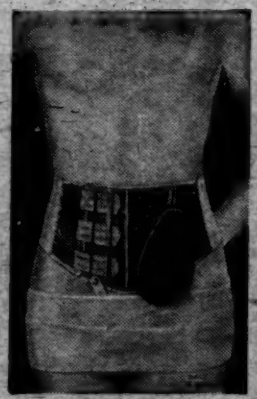

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BRITISH MEDICAL JOURNAL

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TUBERCULOSIS SERVICE IN SCOTLAND

REPORT OF A SUBCOMMITTEE* APPOINTED JOINTLY BY THE CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE OF SCOTLAND AND THE TUBERCULOSIS SOCIETY OF SCOTLAND

In June, 1949, the Central Consultants and Specialists Committee in Scotland and the Tuberculosis Society of Scotland set up a Joint Subcommittee to report on the effect of the National Health Service on the Tuberculosis Service, with special reference to specialists within that service. The Subcommittee has drawn up a report of the highest importance, not only to Scotland but to the rest of Great Britain. It is here reproduced in full.

Introduction

We have interpreted our remit as requiring us to consider the trend of development of the tuberculosis service, and, in association with this, the number of hospital beds which would be required for an optimum service, and the staff establishment which would be necessary to operate such an optimum service. We have given consideration to the training appropriate for specialists in this service and the relationship of these specialists to the medical officer of health. Our conclusions are contained in Part I of this report.

At an early stage in our deliberations we found our discussions constantly turning to the problems inherent in the present serious situation in the management and control of tuberculosis in Scotland. We accordingly prolonged our discussions in the hope of offering some suggestions on how this crisis might be overcome. These suggestions are contained in Part II of this report.

PART I

Historical

The clinico-pathological studies of the great hospital clinicians of the nineteenth century contributed very greatly to our knowledge and understanding of many diseases, among them the dreaded phthisis. These studies and Robert Koch's crucial discovery of the tubercle bacillus in 1882 established beyond all doubt the infectious character of the disease. Its importance as a problem in public health was thus starkly presented. This discovery, the prevalence of the disease, its deadliness, and its tragic social consequences all combined to throw out a challenge which was soon taken up by able and imaginative doctors. Methods of treatment were revolutionized and the value of the sanatorium regime of rest, fresh air, and good diet became quickly established. At first the influence of climate was misunderstood and exaggerated. It was Sir Robert Philip who placed the sanatorium in its proper perspective by associating it, as he did in Edinburgh between 1887 and the end of the century, with a properly devised dispensary and domiciliary service. Philip's concepts have guided the subsequent development of the organized tuberculosis services of this country, of which he is acknowledged to have been the founder.

It has been the customary pattern of the evolution of social services in our country that once an enterprise has been successfully set on foot by the voluntary efforts of its pioneers it is taken over for development by public authority. The tuberculosis service was no exception, and in 1912 it became the responsibility of the major local authorities. From then until 1948 the great bulk of sufferers from pulmonary tuberculosis were treated in institutions administered and staffed by these authorities. So far as the medical staff were concerned this had one unfortunate consequence, in that it tended to keep separate those who worked in dispensaries and those who worked in sanatoria or hospitals. In general, whilst the former aimed at becoming medical officers of health, the professional goal of the latter was a physician-superintendentship. This dichotomy was a defect, undesirable in the interests both of the individual patients and of the service. It arose chiefly in the service of the larger local authorities, who, however, by 1948 had gone far towards remedying it by staff integration.

There has been an important development within the tuberculosis field during the past two decades which has a significant bearing on any consideration of staffing problems within the service. During this period there has occurred a remarkable change in the therapeutic outlook, a steadily increasing use of active surgical procedures, and, more recently, the introduction of antibiotics and other forms of chemotherapy to supplement the old conservative

*The following were appointed by the Central Consultants and Specialists Committee of Scotland: Dr. J. G. M. Hamilton, Edinburgh (chairman); Dr. G. J. Cleland, Mauchline; Dr. I. Simson Hall, Edinburgh; Dr. A. Lyall, Aberdeen; Mr. T. Murray Newton, Glasgow; Dr. A. Smith, East Kilbride. The following were appointed by the Tuberculosis Society of Scotland: Professor Charles Cameron, Edinburgh (resigned); Dr. C. W. Clayson, Lochmaben; Dr. D. G. McIntosh, Dundee; Dr. A. Maclean, Glasgow; Dr. W. A. Murray, Drem. Dr. D. Bell, Aberdeen, and Dr. G. J. Summers, Edinburgh, were co-opted. Dr. E. R. C. Walker acted as the secretary of the subcommittee.

The subcommittee invited to assist them at particular meetings Dr. W. G. Clark, M.O.H. City of Edinburgh, and Miss M. O. Robinson, Chief Nursing Officer, Department of Health for Scotland, who are, of course, not responsible for the opinions expressed in the report.

sanatorium regime. A consequence of this change has been that the tuberculosis specialist is becoming more closely associated with the practices and methods of the general hospital. Indeed, it might almost be said that a cycle is being completed, and that tuberculosis, after a long period of relative segregation, is returning to the wide fold of general medicine.

Organization and Administration

The administration of the major part of the tuberculosis service has now become a function of the regional hospital boards. We agree that this change is desirable, for we feel that the initial diagnosis, in-patient or out-patient treatment, and aftercare of a person suffering from tuberculosis constitute a single clinical problem manifestly coming within the province of the hospital and specialist service under the regional hospital boards. We feel that division of function as between hospital and dispensary could not improve the working of the service, and indeed could only hamper its efficiency. We therefore return to the original conception of Philip of a combined hospital and dispensary unit served by a single medical staff. It seems most desirable that doctors working in this service should utilize and enhance their experience and skill by practice in out-patient diagnostic and therapeutic work, in the treatment of in-patients within the hospitals or sanatoria, and in diagnostic, therapeutic, follow-up, and preventive work in the homes of the people. On grounds of general principle we also feel that those who conduct the ancillary services of mass radiography and B.C.G. vaccination should have direct association with and interest in the other aspects of the service; they should not be condemned to long periods of repetitive routine without the stimulus of varied work. Such integration is no new concept. In Glasgow, for example, development had already proceeded far along these lines before the introduction of the National Health Service. It is our contention that the medical measures required for the control of tuberculous infection in the population at large are so intimately bound up with the care of persons suffering from the disease that they should be an integral part of the tuberculosis service administered by the regional hospital boards. We conceive that, apart from their statutory duties with reference to notifications and the Tuberculosis Register, the functions of the local health authorities through the medical officers of health should be concerned with provisions of a social and environmental character.

The following paragraphs summarize the general policy which we advocate concerning this aspect of the service:

(*a*) There should be close collaboration between the tuberculosis physician and the medical officer of health for the exchange of information and the integration of their separate functions.

(*b*) For the purposes of prevention of the spread of tuberculous infection and of the care and aftercare of the tuberculous patient the regional hospital board should provide the services of medical personnel and the local health authority should provide the services of health visitors, who, however, so far as their clinical work is concerned should be under the control of the senior tuberculosis physician.

(*c*) The work of diagnosis and treatment and of aftercare and prevention are in the modern view so closely related that no useful purpose would be served by requiring the tuberculosis physician and his staff to spend prescribed portions of their time in the service of the regional hospital board on the one hand and the local health authority on the other.

(*d*) The regional hospital board's staff should be responsible for domiciliary consultations at the request of general practitioners; for prescribing specialized domiciliary treatment, in the carrying out of which they should co-operate with general practitioners and health visitors; for the dispensary diagnostic service; for hospital treatment; for clinical aftercare; for the examination of contacts; and, so far as practicable, for the isolation of infection.

(*e*) The medical officer of health should be responsible, on behalf of the local health authority, for the provision of suitable accommodation (houses, shelters, etc.); beds, bedding, and nursing equipment; extra nourishment and clothing; domestic help; the boarding out of children from infected households; the establishment and management of preventoria. In all these matters he should have the advice of the tuberculosis physician.

(*f*) The part played by almoners and social welfare workers in rehabilitation and economic welfare is important. If these workers remain in the employment of the local health authority arrangements should be made whereby they work under the tuberculosis physician so that the latter may keep the medical officer of health informed of the medical aspects of the rehabilitation of individual patients.

(*g*) Mass radiography is a case-finding procedure. It should be regarded as a means leading to early treatment and thus to the prevention of the spread of tuberculous infection. The provision of a mass radiography service should therefore be the responsibility of the regional hospital board, whose officers should constitute the medical staff of the mass radiography units. At the same time much of the detailed administrative work required in the operation of a mass radiography service could be best carried out by the medical officer of health.

Development of the Tuberculosis Service into a Chest Service

There has been a noticeable but natural trend over the past two or three decades for the tuberculosis specialist to concern himself with pulmonary diseases other than tuberculosis. This appears to us to have come about through the introduction and development of such modern techniques as radiology, bronchoscopy, thoracic surgery, and chemotherapy. Furthermore, many tuberculosis specialists have deliberately changed the descriptive titles of their clinics and of themselves in an attempt to overcome the stigma associated with tuberculous disease so as to encourage patients to obtain specialist advice at an early stage. In this way there have arisen the "chest clinic" and the "chest physician." However, this development of the tuberculosis service into a specialist service for all respiratory diseases has been handicapped by the fact that many tuberculosis officers have in the past received a training which has been inadequate to qualify them for the specialist handling of non-tuberculous pulmonary diseases. In the past, tuberculosis officers entered the service of local authorities and, as we have pointed out, in many instances aimed at promotion, not to clinical posts as superintendents of sanatoria but to administrative posts as medical officers of health. It was therefore necessary for the young man in this field to take the Diploma in Public Health and, since his time was limited, to eschew the higher general medical qualifications, such as the M.R.C.P. Nevertheless, many energetic tuberculosis officers, with inclinations strongly developed towards clinical medicine rather than towards administrative work, have by experience and through their own initiative made themselves expert in respiratory diseases other than tuberculosis.

The tuberculosis service should be encouraged to develop into a full chest service working in close relationship with the general hospital and specialist service. At the same time those who are and will continue to be heavily involved in the diagnosis and care of patients suffering from tuberculous disease of the lung, which indeed must remain their predominant concern, will have special knowledge of

the protean manifestations of tuberculous infection. Accordingly they should still be associated with the care of patients suffering from non-pulmonary tuberculous diseases, though there is obviously need for the services of appropriate "anatomical" specialists in the diagnosis and treatment of these diseases.

We therefore propose the following definition of the scope of the future chest service: (*a*) The diagnosis and treatment of tuberculous and other diseases of the chest.* (*b*) Co-operation with the appropriate specialists in the diagnosis and treatment of other forms of tuberculosis. (*c*) The aftercare of persons who have suffered from tuberculous disease. (*d*) The prevention of the spread of tuberculous infection. (*e*) Research and training.

Training

If the tuberculosis service is to develop into an adequate chest service the training of its officers must be altered and improved. The time has now come when the portal of entry into the specialty should be through general medicine and the M.R.C.P. rather than through the public health departments and the D.P.H. We feel that the tuberculosis or chest specialist ought to be thoroughly grounded in general medicine before taking up training in the specialty. With this idea in mind, and having made reference to the reports of the committees of the Royal College of Physicians of London on the training of various specialists, we offer the following recommendations regarding the period and nature of the training of chest physicians:

1st and 2nd years after graduation: Either (*a*) Two years in house-officer posts (of which one post must be in general medical wards); or (*b*) one year in house-officer posts (of which one post must be in general medical wards) and one year in general practice. The posts other than those in general medical wards might usefully be, *inter alia*, in infectious diseases hospitals or sanatoria.

3rd year—Junior registrar
4th year—Registrar
5th year—Registrar
} General Medicine. Obtains M.R.C.P.

6th year
7th year
8th year
} Senior registrar appointments within the chest service.

During the senior registrar period the aspirant should be encouraged to broaden his experience by travelling and by undertaking research work, or by working in non-clinical departments, such as those of anatomy or physiology. During this period he might with advantage acquire the Certificate in Public Health, but we see no particular advantage to be gained by his undertaking the longer and more elaborate course for the Diploma in Public Health.

It is very desirable in our view that the trainee specialist should not spend his early registrar years within the specialty. These years should be spent in the broader field of general medicine, and more closely specialized work should be taken up only after this period of general training has been completed—namely, at the senior registrar stage, or at least not earlier than the fifth year after graduation. It has been argued that this would leave the chest service deprived of junior men for doing routine hospital and dispensary work. However, the routine work referred to is in fact fundamentally important for the training of the chest specialist, and no senior registrar should feel demeaned by having to do such work after he has entered upon the training for his specialty.

*In accordance with the accepted view in this country the term "diseases of the chest" does not include conditions within the sphere of cardiology.

At the same time sanatoria and tuberculosis hospitals, like any others, require junior men of house-officer grade. While these have been difficult to recruit in the past and continue to be difficult to recruit, the requirement of a resident or intern post between graduation and registration proposed in the Medical Bill presently before Parliament should, when in force, provide a source of recruitment from which sanatoria and tuberculosis hospitals will benefit in the same way as general hospitals. It is contrary to his best interests for a young practitioner to declare his intention to enter this specialty by taking a house post in a tuberculosis hospital. A house post in such a hospital should be regarded as analogous to a house post in any other hospital and as providing the same type of experience.

Bed-requirements and Establishments

As noted above, it is our view that the tuberculosis service should be organized in units designed to include both the hospital and the dispensary aspects of the service, and served by a single integrated staff. Such a form of organization having been postulated, it was necessary to consider first the optimum size of population to be served by such a unit, and thereafter the composition of the proposed unit. After examining the position throughout Scotland, it seemed to us that the city of Dundee (population approximately 200,000) provided a suitably compact example which, in relation to both incidence of and deaths from tuberculosis, lay somewhere between the best and the worst. There was further justification for taking this as a model unit, for we were assured that for a concentrated population of this size a single tuberculosis dispensary (chest clinic) would be convenient for the needs of the community. In more sparsely populated districts it is evident that for a similar number of persons a greater number of dispensaries might well be needed to suit the convenience of both patients and staff. It seemed to us, in addition, that this unit of population could be reproduced singly or in multiples in the hospital regions of Scotland.

Estimates of the staff required for operating such a combined hospital–dispensary unit must naturally depend upon the amount of work to be carried out in the dispensary and the number of beds required for the treatment of patients suffering from tuberculosis amongst a population of this size. Various attempts have been made to estimate the optimum bed provision for tuberculosis. The Hospital Surveyors (1945), for example, used the formula of two-and-a-half times the number of deaths from pulmonary tuberculosis in 1938. The adoption of 1938 as the datum line was determined by the fact that this was the last year for which fully reliable figures were available to the surveyors. Since figures are now available for several post-war years, we tested the results of this method of estimation by applying various factors to the deaths in a variety of years both before and after the war. In addition, we obtained from physicians in the regions personal estimates of the regional bed-requirements. Some of the various figures so obtained are set out in the Appendix. It will be seen that no one of these formulae accurately matches all the estimates given by the physicians. The explanation of this divergence we consider to lie in the fact that these formulae could not wholly reflect such local differences as concentration or dispersion of population and the proportional incidence of pulmonary and non-pulmonary tuberculosis. Consequently, while we recognized that a general formula might have its value in deciding an overall policy, yet in respect of the problem under discussion the personal estimates of responsible physicians appeared more suitable.

On this basis we have estimated that for a population of 200,000 the appropriate bed-requirements would lie between 250 and 350.

Based on these figures, both of population and of bed-requirements, and after discussion of the working of such a combined hospital–dispensary unit at the present time, our recommendations are that the following would be an appropriate senior medical staff establishment (expressed in terms of whole-time officers) : three medical officers of trained rank, three senior registrars.

In our opinion the number of medical officers just suggested would be sufficient to undertake hospital, dispensary, and domiciliary attendances, mass radiography, and B.C.G. vaccination, and still leave a margin to permit of appropriate annual leave. It was never in our minds that the particular duties of each member of such a staff should be laid down in any hard-and-fast manner. The senior tuberculosis physician would naturally allocate the duties of the various members of his staff, but we should hope that he would usually find it possible to give the opportunity to all members of his staff to take part in the various activities of the unit. While we recognize that the training of many tuberculosis officers transferred from local authorities to regional hospital boards did not correspond with that which we recommend for the future, we urge the necessity for using the services of all such transferred officers within the integrated staffs we advocate.

We must emphasize at this point our recognition that regional differences in the incidence of tuberculosis, the density of population, and the concentration of hospital or other provisions might be sufficiently great as to render necessary considerable variations in the proposed establishment. It may be appropriate in some areas that one large hospital provides all or nearly all the required beds for a population served by several dispensaries. This might permit of some degree of concentration of staff. Conversely, in extensive and more sparsely populated areas a larger staff might be required to serve a larger number of dispensaries and smaller hospitals.

On the basis of the establishment discussed above, the staff requirements in the five Scottish regions would be as shown in the following Table, which also shows the staff requirements which were independently estimated by tuberculosis physicians in the regions :

Region	Physicians' Estimate	6 Staff per 200,000
Western	89	89
South-eastern	32	32
Eastern	14	12
North-eastern	11	14
Northern	7	6
Total for Scotland	153	153

House-officers

In addition to the staff proposed above it will be necessary for the tuberculosis hospitals and sanatoria to have an appropriate complement of house-officers whose duties should be confined to work in these hospitals. In the larger sanatoria an establishment of one house-officer to approximately 100 beds would be appropriate. It is evident, however, that many of the tuberculosis beds will be in hospitals of smaller size or in wards within general or fever hospitals. Wherever in such circumstances there is a concentration of 60 or more tuberculosis beds the establishment should provide for one house-officer. In the case of still smaller hospitals the services of one or more house-officers might be shared between several hospitals.

Clerical Staff

In the operation of any tuberculosis service there is bound to be a considerable volume of clerical work. We consider that the skill and time of the medical staff should not be dissipated in work which could be done satisfactorily by secretaries and clerks. Therefore, for each notional hospital–dispensary unit we recommend that there should be as a minimum : one secretary, two shorthand-typists, and one filing-clerk, exclusive of the staff required for the particular duties of the mass radiography unit.

Residential Accommodation

Since we envisage the employment of a not inconsiderable number of registrars of senior grade, many of whom may be married, we find it necessary to recommend that immediate steps be taken to increase the residential accommodation for men in this category employed at tuberculosis hospitals and sanatoria. We think that the recruitment of a sufficient number of senior registrars may be difficult under the conditions of accommodation obtaining just now at sanatoria, and because of the critical shortage of houses generally.

PART II

"Crisis Expansion"

During the months which have passed since we were appointed public attention has been increasingly drawn to the disturbing facts of the present tuberculosis situation in Scotland. As is now widely known, the salient point in this situation is that, whereas in England and Wales both the death rate and incidence rate, which rose during the second as during the first world war, have reverted almost to pre-war levels, in Scotland they have not done so. On the contrary, although there may be evidence of a commencing decline in the death rate, the notification figures continue to rise. It is of course recognized that these figures may not be a true index of incidence, since they may in part be explained by improved case finding through mass radiography, examination of contacts, and other means. Nevertheless, the stark fact remains that provision for known cases is tragically insufficient. It is now a common experience for doctors to be unable to arrange for patients suffering from tuberculosis the institutional care they know to be necessary. The important therapeutic advances of recent years make this situation the more distressing for all concerned.

We realize that the responsible authorities are fully aware of all this, have given much anxious thought to the problems which have arisen, and have instituted measures designed to solve them. Nevertheless, we feel bound to record the strong impression left after many hours spent in discussing and considering the present state of affairs, and the steps taken to meet it, that there is lacking any general appreciation of the urgency of the problem and of the need for a real emergency drive to deal with it. Not until it is tackled in a spirit of crusade will the fight be won. A slow building up of first-class sanatorium accommodation is not, in our view, what is called for. There are obvious and cogent reasons why any rapid development of this kind is out of the question. Even if it were not so, it is doubtful wisdom to make long-term and expensive

provision to meet what should and could be only a short-term need. The answer, we believe, does not lie in this direction but in what we have come to describe as a "crisis expansion" on the lines of the Emergency Medical Service so rapidly provided at the outbreak of the last war. The highest priority should be given to all measures which may be expected favourably to influence the situation. We regard it as essential that, while proper and due economy should be exercised in the carrying out of such measures, financial stringency should not be allowed either to weigh against their institution or to handicap their efficacy. For a nation which in the foreseeable future will require the greatest possible proportion of fit workers to allow this to happen would be to be penny wise and pound foolish.

The outstanding problem, though by no means the only important one, is the rapid provision of more functioning hospital beds for tuberculosis, and the greatest single obstacle to achieving this is recognized to be the shortage of nursing staff.

Bed Accommodation

According to such information as we were able to obtain in the autumn of 1949, the total number of hospital beds in Scotland then available for the accommodation of patients suffering from all forms of tuberculosis was approximately 6,000, but of these some 500 could not be used owing to lack of nurses. As shown in the Appendix, the total number of beds required according to the physicians' estimates for the hospital treatment of all types of tuberculosis is 7,605. It was further estimated by these physicians that of these beds approximately one-seventh would be required for the treatment of non-pulmonary tuberculosis. The estimated requirement for pulmonary tuberculosis is, therefore, approximately 6,500 beds. By the deduction of a similar proportion for non-pulmonary tuberculosis the number of beds available for pulmonary tuberculosis in the autumn of 1949 was 5,150. From these figures we concluded that some 1,350 additional beds would meet the present need.

We have endeavoured to obtain information about the number of beds at present available in infectious diseases hospitals. It has not proved possible to obtain completely reliable returns, but from such information as we did obtain we are satisfied that the total number is very considerable. On the average only about one-third of the beds in infectious diseases hospitals are occupied at any one time by patients suffering from infectious diseases other than tuberculosis. After setting aside a further one-third for emergency purposes it should, in our view, be possible to make available the remainder of the beds in these hospitals for the purpose of the crisis expansion we have in mind, provided the problems of improvisation, organization, and staffing can be solved. We fully appreciate that some technical difficulties would have to be overcome. For example, the present open-ward system obtaining in the great majority of these hospitals makes it necessary to assign whole wards to the treatment of different types of infectious disease. Under this system whole wards may stand empty or be occupied by only a few patients for quite long periods of time. The solution to this problem we believe to lie in the reconstruction, makeshift or permanent, of at least a proportion of these wards into cubicle wards. If this were done on the appropriate scale it should be possible to provide for the treatment of tuberculosis the necessary 1,350 beds over and above those already in use in infectious diseases hospitals for the care of tuberculous patients.

Whilst we believe that this would be the most satisfactory way of meeting the need, it might be found impracticable for one reason or another to provide in this way all the beds required. Should this prove to be the case the most careful consideration should be given to the possibility of using wards in general hospitals. The regional hospital boards and their medical education committees may feel that the larger teaching hospitals should be excluded from any scheme of this kind, but it should be possible to find a considerable amount of accommodation in other general hospitals.

To sum up, we are convinced that there are available in Scotland hospital beds to the number required for a crisis expansion.

Shortage of Nursing Staff

There are three categories of staff required—namely, trained nurses, student nurses, and part-trained personnel. In the first and third categories the nurses may be in part-time employment. Any rapid critical expansion must rely on the services of nurses from all three, and particularly on extensive use of part-time and part-trained nurses. Indeed, such expansion as has occurred during the past few years has been achieved largely by this system of "dilution" rather than by any substantial increase in the number of young women entering tuberculosis nursing as a career. In some hospitals part-time nurses and untrained personnel form 50% or more of the staff, but there is naturally a number of factors which limit the extent to which this system can be used, apart from the obvious one of the total number of such persons available. One limiting factor, for example, is the number of trained nurses with the necessary qualifications and experience to fill the senior charge posts.

The efforts which have been made to recruit nurses for sanatorium work seem to have been directed almost entirely towards the student nurse, the part-time nurse, and the part-trained auxiliary. It seems to have been assumed that the trained nucleus of the service was relatively static and only to be increased by increments from those completing their training in the ordinary way. Even given a highly satisfactory recruitment of student nurses this could only mean a relatively slow expansion once the initial dilution had been achieved. With a recruitment scarcely above replacement level it is evident that little increase is to be looked for except through a significant recruitment from outside to the senior ranks within the service.

It is to this means of expansion that attention should now be directed. We believe that a successful recruiting campaign might well prove to be the key to the solution of the expansion problem. Moreover, it offers in this field the advantages of a short-term scheme to deal with a short-term emergency, which we have already pointed out in connexion with the finding of beds. Utilizing the same degree of dilution by part-time nurses and part-trained personnel as has been referred to above, we estimate that the recruitment of approximately 150 trained nurses would permit of the opening of the 1,350 beds which we have reckoned to be necessary. We are aware that the possibilities of recruitment of part-time and part-trained nurses vary in different parts of the country, but we cannot imagine that the supply has been nationally exhausted. In our view the new beds which might be made available in this way need not be proportionately distributed all over the country; it would have a marked effect on the national problem even if they were wholly confined to one region.

Recruitment of Trained Nurses

We consider that an important, possibly the principal, source of recruitment of this trained senior staff will be found among the group of nurses who, having completed their training, are now in their parent hospitals as junior sisters or staff nurses, often more or less "marking time" while awaiting promotion to full charge posts. The opportunity of a responsible charge post in the tuberculosis service, supplemented by the stimulating prospect of playing a part in a task of urgent national importance, might well attract trained nurses already in such employment in general hospitals. We consider that the matrons of general hospitals should be invited to co-operate whole-heartedly in bringing the needs of the tuberculosis service to the attention of nurses in the categories we have described. It is only with the energetic and interested support of the senior administrators in the general nursing service that a recruiting campaign of this kind can be expected to succeed.

We have felt that many nurses are repelled from work in sanatoria in the mistaken belief that little clinical interest attaches to such work. Modern advances in the treatment of pulmonary tuberculosis have been such that the speed of turnover at sanatoria has increased and a much greater proportion of patients suffering from this disease are susceptible to active medical and surgical treatment, with real prospects of alleviation or cure. While it cannot be denied that the average stay in hospital of patients suffering from tuberculosis is much longer than that of patients in general hospital wards, nevertheless these modern therapeutic advances have changed the atmosphere in sanatoria so that it is now comparable to that obtaining in active general hospitals.

We are strongly of the opinion that an essential part of any recruiting campaign which aims to attract the trained nurse must include appropriate lectures, by tuberculosis physicians and senior tuberculosis nurses, designed to give a true picture of a nurse's life and work in a modern sanatorium. A campaign with this object must attempt to remove the doubts which still exist in the minds of women concerning the risks of contracting tuberculous disease while working in tuberculosis hospitals and sanatoria. The necessary assurance can confidently be given, for it is generally considered that these risks are in point of fact smaller in well-run sanatoria than they are in general hospitals, which, by virtue of the pressure of present circumstances, are often obliged to admit and care for cases of open tuberculosis under hygienic conditions far below those demanded by sanatoria.

We are aware that in the past the conditions in which nurses lived and worked in some tuberculosis institutions have been bad by any standard, as indeed they have been in many other hospitals. The existence of these "black spots" must have influenced the attitude of matrons and others responsible for the welfare of nurses and thus acted as a serious deterrent to the recruitment of nurses. While we cannot claim that the living and working conditions of nurses in every sanatorium have yet reached the optimum standard, nevertheless it is undoubtedly true that a good standard has been reached in the great majority. This fact should be brought energetically to the notice of nurses in general.

Recruitment of Student Nurses

We have been informed that there is a surplus of applicants for many training schools. We understand that in many instances such applicants as cannot be accepted are directed by matrons to the appointments offices of the Ministry of Labour and National Service. The co-operation of matrons should be sought in regard to this, in order that they may strongly urge upon girls whom they cannot take into their own schools that they should seriously consider taking up tuberculosis nursing. The responsible officers in the appointments offices should also be instructed to press the claims of tuberculosis nursing upon those who seek their advice. We have received evidence that this is not always being done at the present time.

One of the major deterrents to the entry of young women to nursing in the tuberculosis service has been the objection on the part of their parents, based upon the public's exaggerated fear of the risks of acquiring tuberculous disease. The crusade against tuberculosis ought to contain as an important and integral part a campaign designed to educate the public, first, regarding the size and national importance of the problem, and, secondly, regarding the correct assessment of the risks undertaken by those who take up tuberculosis nursing. Such a campaign should include the dissemination of factual information regarding the degree of protection which can be conferred on tuberculosis workers by B.C.G. vaccination. The public should be informed of the comparative freedom from risk associated with nursing in sanatoria. We suggest that in a thorough and intensive campaign of this sort the co-operation of the B.B.C. should be invoked. We have in mind such a feature as "Focus on Tuberculosis" in which, by using the services of physicians, surgeons, nurses, and patients, emphasis could be laid upon the new and optimistic therapeutic outlook in this disease. The object should be clearly defined as an attempt to raise the campaign against tuberculosis to the level of a nation-wide crusade. It may be that in doing so the services of publicity and advertising experts could also be invoked with advantage.

What has been said in the foregoing paragraphs about the recruitment of trained and student nurses applies equally to that of part-time and part-trained personnel.

Industrial Nurses

The total number of trained nurses at present employed in industry is comparatively small and we do not think that any recruiting campaign should be specifically directed towards nurses so employed. We feel most strongly, however, that the needs of the tuberculosis service are so crucial that in the meantime any further recruitment of trained nurses into the industrial field should be actively discouraged. There is a legitimate demand for the services of nurses in industry, but this can be met, at any rate temporarily, by the greater use of first-aid workers.

Extension of Facilities for Domiciliary Treatment

As an immediate step and pending the successful outcome of an energetic recruiting drive for nurses, a most useful contribution might be made by extending to patients in their homes some of the forms of active treatment normally used only in hospital. It has been within the experience of most practising doctors that patients notified as suffering from pulmonary tuberculosis may wait for months before obtaining hospital beds, and during this time the illness may advance to such an extent as to diminish their chances of recovery or at any rate to ensure that they will occupy the hospital beds which they eventually reach for a longer period of time than would have been the case had they been under active treatment from the start. A proportion

of beds should be set aside in sanatoria for short-term cases who could be given, for example, appropriate collapse therapy and then returned to their homes where supervision could be continued. It is possible for such patients to be brought to the dispensary or hospital as often as is necessary for continuation of active treatment.

While the day-to-day supervision of patients undergoing domiciliary treatment should be largely in the hands of their own practitioners, it is desirable that full specialist co-operation should be available, and this may well involve an immediate increase in the specialist staff on present establishments. It is important in this regard that the regional hospital boards should institute some form of direct contact between the specialists in the tuberculosis service and general practitioners. We have in mind not only individual contact in connexion with individual cases but the institution of professional meetings at the hospitals or clinics, at which there could be expounded the modern views of treatment and control of tuberculous disease. We have received so much evidence of the interest which general practitioners are taking in the problem of tuberculosis in their practices that we feel sure that such a procedure would be received with general approval.

Hostels and Night Sanatoria

We have considered the suggestions which have frequently been made that night sanatoria or hostels for tuberculous workers should be provided. There has been little practical experience of these in this country, and it seems to us that grave difficulties would be encountered in obtaining any large measure of consent to their use, both from the sufferers themselves and from their relatives. There persists, unfortunately, a degree of social ostracism of the tuberculous, and this would militate against the wide use of hostels or living quarters for those whose ordinary work and recreation in any case would require to be sought in the general community.

The Ministry of Labour and National Service in their schemes for the tuberculous have up till now been unable to provide for persons with open tuberculosis, because their workshops are manned by persons disabled by various conditions. Difficulty has been experienced in making arrangements for the training even of patients with quiescent as opposed to healed tuberculosis. Consideration might be given to the development in the larger sanatoria of hostel accommodation for ex-patients, both sputum-positive and sputum-negative. The former might be encouraged to stay for relatively long periods if small factories within the sanatoria could offer remunerative work. Under present circumstances any larger attempt at colonization of the tuberculous is not possible, and we doubt whether at any time colonies such as those at Papworth would offer any substantial contribution to the solution of the problem in Scotland.

Preventoria

The institution of preventoria may be expected to play a valuable part in preventing the spread of tuberculous disease. While the policy of instituting preventoria appears to have been accepted by the central authorities, few active steps have yet been taken to implement it. Energetic measures should be taken by central and local authorities to make available suitable buildings for the reception and care of children from homes in which tuberculosis has appeared. In our view such preventoria should be similar in type and organization to the wartime residential nurseries. The recruitment of children's nurses and supervisors for such establishments might not be easy, but we recall that it was found possible to recruit sufficient staff for the wartime nurseries, both day-time and residential.

An appeal for persons to undertake work of this kind, backed as it would be by the general propaganda campaign, is not likely to fail. We would again emphasize that narrow monetary considerations should not be allowed to be a stumbling-block.

B.C.G. vaccination of children involves the segregation of those selected for vaccination for a period of weeks. The preventoria which we envisage would seem to be suitable establishments for this segregation, but we regard it as important that the establishment of preventoria should not await a widespread introduction of B.C.G. vaccination, nor should their use be limited to the segregation of children undergoing this form of immunization.

Housing

The importance of the part played by faulty housing in undermining attempts to eradicate tuberculosis from the community needs no emphasizing by us. Medical officers of health are fully aware of this, and local authorities are doing their best to meet the needs. Improved housing of families affected by tuberculosis attacks the problem in two ways. First, it lessens the danger of spread of the disease by making possible effective room segregation of patients. Secondly, and for the same reason, it makes possible the domiciliary treatment of chronic cases, thus freeing hospital beds for those who can most benefit from hospital treatment. Every encouragement should therefore be given to local authorities to adopt energetic and imaginative measures to provide for affected families. Here again we would stress that the accent should be on "crisis expansion."

Central Responsibility

Because of the national character of the problem the Department of Health for Scotland, as the central authority, would be closely involved in the various projects we have described for tackling the present situation. All these, as we have tried to indicate, are but parts of what is essentially a single operation. For this reason there will clearly be need for effective central co-ordination and direction. It may be that the Department will feel that this need can be met through their present establishment and arrangements, but we suggest that careful consideration should be given to the desirability of appointing an appropriately qualified person to undertake this task. Such an appointment, we suggest, should be of a temporary character, perhaps for a period of three to five years. In our view it should be held by a medical man of proved administrative ability and wide experience in the tuberculosis field. Whether this appointment be made or not, we consider it to be essential, if our proposals are to be successfully adopted, to have in being a consultative committee of experts available to advise on their implementation.

SUMMARY OF PART II

The present situation in the management and control of pulmonary tuberculosis in Scotland is so serious as to be critical, and can be met only by a "crisis expansion" of the tuberculosis service.

1,350 additional beds are urgently required for this expansion.

These can quickly be made available in infectious diseases hospitals by structural improvisation and modification.

The greatest single obstacle is the shortage of nursing staff.

We have made proposals for a recruiting campaign, the principle feature of which is the attraction of trained nurses to the tuberculosis service.

All steps should be taken to make active modern treatment available to the patient in his home.

Much more energetic steps should be taken to provide preventoria.

As part of a "crisis expansion" local authorities should adopt a bold and imaginative policy in the allocation of houses.

Money spent freely but wisely for these purposes will prove to be a sound national investment.

A vigorous, sustained, and well-planned campaign of public education regarding tuberculosis should be undertaken.

We have made recommendations for the central co-ordination and direction of these operations.

A much greater sense of the urgency of the situation is required on the part of all—the general public, the administrators, the nurses, and the doctors. What has hitherto been a desultory and intermittent campaign must be transformed into nothing less than a national crusade.

The subcommittee wish to record their keen appreciation of the tireless work and indispensable assistance given by their secretary, Dr. E. R. C. Walker, and the clerk to the subcommittee, Miss S. V. Williamson, and to express their indebtedness to the British Medical Association for the facilities afforded.

APPENDIX

Beds Required for Optimum Service

Region	Population	Present Beds (Autumn, 1949)		Requirements Based on Physicians' Estimates	2½ × 1938 Pulmonary Tuberculosis Deaths (Hosp. Surveyors, 1945)	2½ × 1946–8 Average Annual Pulmonary Tuberculosis Deaths	2¾ × 1946–8 Average Annual Pulmonary Tuberculosis Deaths
		Staffed	Unstaffed				
Northern ..	195,000	228	3	355	232	285	314
North-eastern ..	506,000	428	21	516	380	415	457
Eastern	419,000	401	53	600	472	540	594
South-eastern ..	1,135,000	948	126	1,580	1,140	1,365	1,487
Western	2,914,000	3,513	301	4,554	4,227	5,690	6,259
Total for Scotland	5,169,000	5,518	504	7,605	6,451	8,295	9,111

TREATMENT OF PAINFUL AMPUTATION STUMPS

BY

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Last year one of us (Russell, 1949) described a method of treating painful amputation stumps and phantom limbs by repeated percussion to the stump neuromata. This form of treatment was developed on the theory that conduction in a mixed nerve is easily interrupted by repeated pressure without causing pain, and that the regenerating nerve fibres which form neuromata in an amputation stump might well be even more vulnerable to minor trauma than are normal nerves and nerve endings. It was considered likely, therefore, that if painful neuromata are repeatedly hammered their nerve fibres will gradually degenerate and be replaced by fibrous tissue. It was hoped that this process would be followed by relief of spontaneous pain, and in the report mentioned above seven consecutive cases were described, all of which responded remarkably well to this form of treatment. These seven patients have recently been followed up, and the progress report of all of them has been very satisfactory. Most have been able to discontinue treatment to a large extent, but some still give the stump an occasional hammering if the pain shows a tendency to recur. These patients have therefore either lost all tendency for the pain to recur, or, if they have slight twinges, these can be removed by a short period of treatment. This is most encouraging, for the evidence available indicates that with the passage of time there is no tendency for the pains to become resistant to the treatment—rather the reverse.

Further Cases

The purpose of this paper is to give the results achieved in further cases, and to include more details of the methods used.

We have had under consideration 37 further cases, but a number of these had disabilities which rendered them unsuited to percussion treatment. For example, in three cases the amputation followed extensive nerve lesions of the limb concerned; one case had a cold, diffusely tender stump which was relieved by sympathetic nerve block as advised by Leriche (1939); one case had sciatica, one had osteoarthritis of the spine, two had faulty prostheses, one was a major hysteric, and one refused to co-operate.

There were, however, 33 cases, including the seven published in 1949, which seemed to suffer from pain in the stump or phantom limb of such a nature that treatment by percussion was at least worth a trial. The main features of these cases are given in Table I.

Percussion treatment has been adopted elsewhere, and a number of cases which have proved resistant to this and to other forms of treatment have been referred to us. These cases fall into the second half of Table I, and owing to this selection of cases the results shown in that half of the table are not so good as in the earlier cases.

From the table it will be seen that there were 26 cases of lower-limb amputations (22 above the knee) and eight

TABLE I.—*Chief Features of the Main Group of Cases*

Case No.	Age	Site of Present Amputation	Date of 1st Amputation	Chief Operations	Interval from 1st Amputation to Onset of Pain	Pain		"Jactitations" of Stump		Temperature of Stump to Touch	Palpable Neuromata	Pain on Pressure on Neuromata or Tender Areas in Stump. Referred to:		Results		
						Phantom	Stump	With Pain	Without Pain			Phantom	Stump	1 Week	1–3 Months	Over 3 Months
1	25	L. finger	1937	1944, symp.	6 years	Lanc.	Tend.				Yes	Yes	Yes	Exc.	Exc.	Exc. 5 years
2	25	R. thumb, 2 fingers	1947	1948–9, st. (4)	At once	Ach.	Tend.				,,		,,	,,	,,	Exc., 12 m.
3	24	L. shoulder disart.	1944			,,	No				,,	Yes		,,	,,	Exc., 12 m.
4	47	R. A/K	1917	1917, B/K amp.; 1920, A/K amp.; 1929–42, neur. (6); 1946, n.s. (sci.)	11 years	Lanc., rig.	,,	Yes		Normal	,,	,,	No	I.S.Q.	,,	Exc., 11 m.
5	54	R. A/K	1947		At once	Rig.	Ach.	,,	Yes	,,	No	,,	,,	Imp.	Good, 2 m.	Imp., 10 m.
6	59	R. A/K	1934		14 years	Lanc., rig.	No	,,		,,	,,	,,	,,	,,	Exc.	Exc., 4 m.
7	37	L. B/K	1943		2–3 weeks	Ach., rig., comp.	,,	,,		,,	Yes	,,	,,	Exc.	,,	Exc., 9 m.
8	38	R. A/E (L. A/K)*	1944	1944, A/E (and A/K) amp.; 1947 neur.; 1948, symp.	4–5 days	Ting., rig.	,,	No	No	Warmer than normal	,,	,,	,,	I.S.Q.	Imp.	Imp., 7 m.
9	50	L. A/K	1926	1926, disart. at knee; A/K amp.	4 years	Lanc.	,,	Yes	,,	Normal	No	,,	,,	,,	,,	Good, 7 m.
10	53	L. A/K	1915	1915, A/K amp.; 1937–49, neur. (several)	22 ,,	Ach.	Lanc.	,,		,,	Yes	,,	,,	Good	Exc.	Exc., 8 m.
11	52	R. A/K	1917	1917, A/K amp.; 1918, st.; 1946, st.; 1947. n.s. (sci.)	27 ,,	No ph.	,,	,,	No	Cold	No	No	Yes	I.S.Q.	Good	Imp., 7 m.
12	53	L. A/K	1929	1929, A/K amp.; 1931, st.	1½ ,,	Tick.	,,	No	,,	Normal	,,	,,	,,	,,	Exc.	Exc., 6 m.
13	55	R. A/K	1917	1917, Syme's amp., st.; 1918, A/K amp.	At once	Comp., lanc.	No	Yes		,,	Yes	Yes	No	,,	Imp.	I.S.Q.
14	42	L. B/K	1948		7 months	Burn.	,,	,,	Yes	Cold	No	,,	,,	Imp.	,,	Good, 6 m.
15	60	R. hip disart.	1921		27 years	Burn., lanc. comp.	,,			Normal	Yes	,,	,,	Exc.	Exc.	Exc., 8 m.
16	49	L. A/E	1941	1941, B/E amp.; 1942, A/E amp.; 1943, n.s. (br. pl.), neur.; 1944, mes. tract.	At once	Ting., rig.	Tend.	Yes		,,	,,	,,	Yes	I.S.Q.	I.S.Q.	
17	65	L. A/K	1916	1916, A/K amp.; 1945, st. (2)	25 years	Ach.	No			,,	No	No	,,	,,	,,	
18	50	R. A/K	1918	1918, A/K amp.; 1919, st.; 1948, sp. an.	2 weeks	,,	,,	Yes		Cold at tip	Yes	Yes	No	Exc.	Exc.	
19	58	R. B/K	1948		3 ,,	Rig., lanc.	Tend.	,,		Normal	No	,,	Yes	I.S.Q.	Imp.	Good, 4 m.
20	60	L. A/K	1915	1915, A/K amp.; 1916, st.; 1922, neur.; 1933, neur.; 1937, st.	1½ years	No	Lanc.	,,	Yes	Cold before pain	,,	No	,,		I.S.Q., 1 m.	Imp., 4 m.
21	70	R. A/K	1918	1918, B/K amp.; 1919, st. (2); 1920, A/K amp.	31 ,,	Ach.	No	No	No	Cold at tip	,,	Yes	No	Imp.	I.S.Q., 3 m.	
22	58	L. A/K	1916	1916, A/K amp.; st.	3 ,,	No ph.	Ach.	Yes	Yes†	Normal	,,		Yes	,,	Good, 3 m.	
23	36	L. A/K	1942	1942, A/K amp.; 1944, st.	3 ,,	Burn.	No	,,	,,†	,,	,,	Yes	No	I.S.Q.	I.S.Q.	
24	58	L. A/K	1919	1919, B/K amp.; 1923, st.; 1924, A/K amp.; 1926, n.s. (sci.); 1931, neur.; 1934, neur.; 1943, n.s. (sci.)	2 ,,	,,	Ach.	No	No	,,	Yes	,,	Yes	Imp.	Good, 2 m.	
25	64	L. A/K	1918		At once	Lanc.	No	Yes	Yes	,,	No	,,	No	I.S.Q.	I.S.Q.	
26	65	L. A/E	1916	1916, 3rd fing. amp.; 1925, 4th and 5th fing. amp.; 1926, symp.; 1930, A/E amp.; 1942, neur.; 1950, see text	26 years	No	Burn.	,,	No	Cold	Yes	,,	Yes	I.S.Q.	I.S.Q., 2 m. (see text)	
27	63	R. A/K	1917	1917, A/K amp.; 1922, st.; 1931, n.s. (sci.)	At once	Burn., lanc.	No	,,	,,	Normal	No	No	No	,,	Good, 2 m.	
28	53	L. A/K	1917	1917, A/K amp.; 1929, st.	,,	No	Lanc.	,,	,,	,,	,,	,,	Yes		I.S.Q., 7 w.	
29	26	L. B/K	1944	1944, Syme's amp., B/K amp.	2 months	Ach.	Tend.	,,		,,	,,	Yes	,,	Imp.	Good	
30	51	L. A/K	1918	1918, A/K amp., st.; 1921, neur.	At once	Ach., lanc.	No	,,	Yes	,,	Yes	,,	No	Exc.	Exc.	
31	70	R. A/E	1918		3 years	No	Lanc.	,,		,,	,,	,,	,,	I.S.Q.	I.S.Q.	I.S.Q., 8 m.
32	45	R. A/E	1948	1948 (before amp.) symp.; A/E amp.; 1949, st. (3)		No ph.	Burn., ting.	,,	Yes	Warmer than normal	,,		Yes	,,	Imp.	Imp., 6 m.
33	48	R. A/K	1944		At once	Lanc.	No	,,	No	Normal	No	Yes	No		Imp., 2 m.	Good, 3½ m.

Cases 1–7 are those described in a preliminary report (Russell, 1949).
* This man had a double amputation. He complained of pain only in the upper-limb phantom.
† Jactitations occurred at times when these patients were asleep.

Abbreviations:
Amputations: A/K, above knee; B/K, below knee; A/E, above elbow; B/E, below elbow; Disart., disarticulation.
Operations: Amp., amputation; neur., neuromectomy; mes. tract., mesencephalic tractotomy; n.s. (br. pl.), nerve section (brachial plexus); n.s. (sci.), nerve section (sciatic nerve); sp. an., spinal anaesthetic; st., other stump operations.
Pain: Ach., aching; burn., burning; comp., complex; lanc., lancinating; rig., rigidity; tend., tender; tick., tickling; ting., tingling; no ph., no phantom limb on first attendance.

Definitions:
Excellent (exc.): Having no pain or able to dispel occasional attacks of pain for certain by percussion.
Good: Much less pain but not completely amenable to percussion.
Improved (imp.): Having less pain.
Unchanged (I.S.Q.): No apparent benefit from percussion treatment.

upper-limb amputations (six above the elbow). One man (Case 8) had had both an arm and a leg amputated, but complained of pain in the phantom arm only. A surprising finding in many cases was the long interval between the original amputation and the onset of pain. This interval was over one year in 16 cases and over five years in nine. Nineteen of the patients were wounded in the first world war, and eight in the second world war. In all cases amputation had been undertaken because of the direct or indirect results of trauma.

The Stump and Phantom Pains

The sensation of a phantom limb appears after nearly all amputations, as has been maintained by Weir Mitchell (1872), Leriche (1939), and Henderson and Smyth (1948). Not only had all our cases experienced phantom-limb sensations, but in all except three (Cases 11, 22, 32) these sensations were still present, generally in association with phantom-limb pains. The persistence of phantom sensations was therefore a marked feature in this group of cases. This contrasts with the experience of Henderson and Smyth (1948), who studied the "normal" phantom sensations in some 300 men with amputations in a prisoner-of-war camp. About 98% of their cases experienced the sensation of a phantom limb after amputation, but after six to twelve months the phantom sensations were only rarely felt, while they had for the most part disappeared after two to three years. Only about 6% of these 300 complained of pain during the period of observation.

The pains of which the patients complained were clearly often of very great severity. They were referred to the phantom limb in 17 cases, to the stump in seven, and to both phantom and stump in nine cases (Table I).

The patients' descriptions of the pain are very varied, but a distinction should be made between the pains which are almost always present in some degree and the pain which occurs in bouts. The latter consists of severe lancinating or stabbing pain recurring several times a minute and lasting for several hours or even days. In severe cases the patient is very miserable during a bout, and the pain is reminiscent of severe trigeminal neuralgia. During an attack the patient is reluctant to allow the stump to be touched, and is careful to prevent even a draught from playing on it, while the stump jumps or jactitates with each jab of pain.

Case 25.—A man aged 64 was wounded in the left leg and thigh in September, 1918, and two days later the limb was amputated just above the upper wound at the level of the mid-thigh. Before amputation he had severe pain in the left hip, upper thigh, and in the foot, but the areas in which he had been wounded felt numb. Since amputation he has been liable to attacks of stabbing pain. It is felt in the phantom limb, mainly in the ankle, especially the lateral side, and each stab is accompanied by a jactitation of the stump. Attacks at first lasted only two hours and recurred every two to three weeks, but in the past two years the pain has grown steadily worse, and attacks last 12 to 24 hours and recur every two to seven days. During an attack he is quite incapacitated. The first follow-up report on this case was not satisfactory, and further observation will be required.

In addition, however, to these "nerve" pains, many patients describe a painful set rigidity of the toes or fingers which can be particularly unpleasant. Other types of pain often accompany this rigidity, as in the following case.

Case 19.—A man aged 58 had a railway goods truck pass over his right leg in July, 1948, and a few hours afterwards the leg was amputated below the knee. Three weeks later he began to feel pain in the phantom limb. It was of four types. The fourth and fifth toes were constantly hyperflexed and painfully rigid; the big toe felt rigid and constricted "as though it were protruding through a hole in his sock but more uncomfortable"; tight cramp-like sensations were felt in the phantom calf muscles; and lastly there were occasional pains shooting into the lateral side and ball of foot, the big toe, and the fourth and fifth toes. This man had an extremely tender stump and gradually improved with percussion treatment.

One may wonder why this feeling of rigidity is so painful. Livingston (1943) describes how he asked a patient "why the sense of tenseness in the [phantom] hand was so frequently emphasized among his complaints. He asked me to clench my fingers over my thumb, flex my wrist, and raise the arm into a hammerlock position and hold it there. At the end of five minutes I was perspiring freely, my hand and arm felt unbearably cramped, and I quit. 'But you can take your hand down,' he said."

Complex sensations may also be described, as in the following case:

Case 7.—A man aged 37 was wounded in the sole of the left foot in October, 1942, and in January, 1943, the leg was amputated below the left knee. Two or three weeks after amputation he began to feel an aching pain in the lateral side of the ankle and to have the sensation both of the presence of the wound in the sole of his foot and of the nail of his big toe being twisted off. When he percussed neuromata in the stump he felt at first a temporary aggravation of the phantom sensations. These included the opening of the wound in the foot and a sensation of blood running between the fourth and fifth toes. He says that he does not remember experiencing this sensation before amputation. Percussion on one spot at first intensified the feeling that the nail of his big toe was being torn off, and then caused the toenail sensation to disappear. The patient responded very quickly to percussion, and nine months later wrote that he was able to play strenuous table tennis. Occasionally when he was taking less exercise he began to get a slight recurrence of pain, but he could at once drive it away with percussion.

Examination of the Stump

The amputation stumps varied greatly, but on the whole the spontaneous pains seemed to depend on factors showing no connexion with the general state of the stump tissues other than nerves.

Most of the cases with frequent or continual pain had tender neuromata or hyperaesthetic scars which on pressure caused pain that was often referred to the phantom and caused jactitation. This tenderness on pressure with pain radiating to the phantom appeared to be due to neuromata of large or small size which were the "touch" spots for the pain. We have come to regard this type of reaction as an indication that treatment by percussion is likely to be successful.

Details of Treatment by Repeated Percussion

Treatment by percussion depends on the view that if the thousands of nerve fibres in a neuroma are repeatedly subjected to trauma they degenerate, cease to be tender, and lose their capacity for causing spontaneous pain.

Every effort is therefore made to find and locate as accurately as possible all tender neuromata. They can generally be felt as nodules a few millimetres to a few centimetres in diameter which on pressure give paraesthesiae referred to the phantom or, less commonly, cause local pain. In some cases the neuromata are so covered by muscle that their presence can be presumed only if a well-localized area can be found where pressure or hammering elicits paraesthesiae in the phantom or marked local pain.

If the neuromata are very tender a sphygmomanometer cuff is applied to the proximal part of the stump and inflated sufficiently to occlude the arterial blood supply.

FIG. 1.—Mallet and applicator in use.

After some minutes the anoxaemia makes the neuromata less sensitive* and they can be percussed. This is usually done with a mallet and an applicator consisting of a wooden shaft about 15 cm. long with a metal "dome of silence" on one end to provide a smooth contact that will not damage the skin and a crutch rubber on the other to deaden the sound of tapping (Fig. 1). The applicator is held firmly on the neuroma and hammered with the mallet as hard and as rapidly as is possible without causing the patient undue discomfort. If the patient has sensations referred to the phantom or stump these confirm that the applicator is well placed on the neuroma.

After percussion has been performed for several minutes the cuff is removed and percussion is continued for 20 minutes. After the first treatment the cuff is generally not necessary, and the percussion is repeated three or four times daily.

An electrical vibrator is sometimes preferred to the mallet. It gives percussion over a wider area, but is less powerful and is sometimes more apt to bruise the skin than is the mallet and applicator. Whichever form of treatment is used the patient is taught to apply it himself. Electrical vibrators† are especially useful in upper-limb amputations which the patient cannot himself treat with a mallet and for dealing with lower-limb neuromata which the patient can-

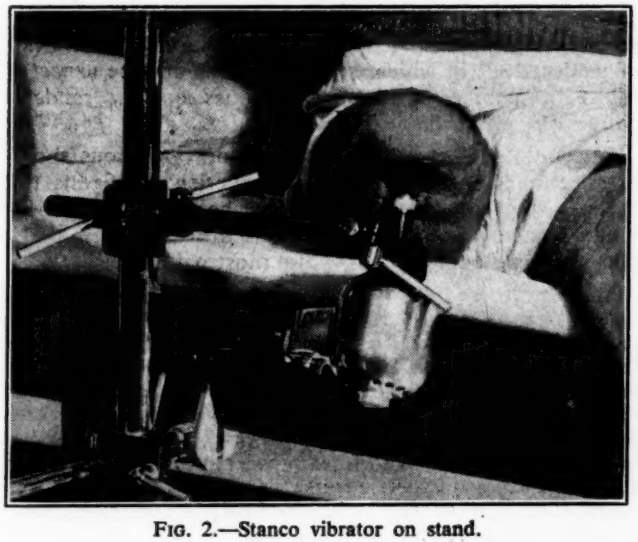

FIG. 2.—Stanco vibrator on stand.

not reach. A stand to hold the vibrator firmly in any desired position is an advantage for treatment in hospital (Fig. 2), as prolonged handling of a vibrator causes numbness of the physiotherapist's hands.

A more powerful percussor‡ (Fig. 3) with a remote drive has been found useful for treating deeply placed neuromata. Only smooth metal or vulcanite applicators should be used with mechanical vibrators: other materials, such as rubber, are apt to damage the skin by friction.

The response of a favourable case is illustrated by the following report:

Case 15.—A man aged 60 was wounded in the thigh in June, 1918. The wound healed quickly, and for six months he walked well, but was then found to have a tuberculous infection of the upper part of the femur. The head and neck were excised, and shortly afterwards, in 1921, the right lower limb was disarticulated at the hip. He had no pain until November, 1948, when he began to feel an intermittent burning sensation in the toes and lateral side of the phantom foot, accompanied by the sensation of jerky and powerful plantar flexion at the ankle.

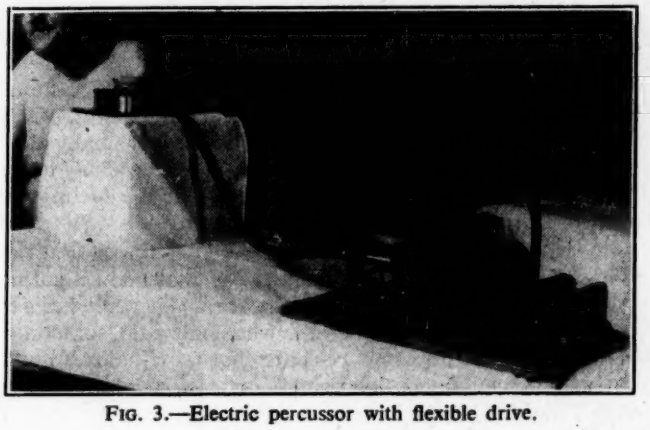

FIG. 3.—Electric percussor with flexible drive.

At other times, especially at night, the phantom limb felt fixed in flexion and he could not get to sleep until he had straightened it.

He had a well-marked sciatic neuroma. When this was percussed he felt a variety of sensations in the phantom leg, mainly a feeling of fixity or tension, but even after a single treatment of 15 minutes he volunteered that his leg was now at rest and within four days he had a longer night's sleep than for four months. Nine months later he was never bothered with pain and he only rarely needed to use the mallet. He was able to withstand the jolts of his local bus and the changes of weather, either of which had formerly brought on pain.

In other instances, however, the benefit of treatment becomes apparent more slowly.

Case 12.—A man aged 53. At the age of 3 years he had an illness which left him with a weak left leg, and in adult life the leg was 2 in. (5 cm.) shorter than the right. In October, 1929, he was involved in a road accident and suffered injuries to his head and left leg. He was unconscious for 13 days, but has had no permanent disability from the head injury. The left leg was amputated at the level of the mid-thigh 14 days after the accident. Eighteen months later he developed a sinus and a sequestrum was removed. After this operation he began for the first time to feel spontaneous pain, which was intermittent with periods of complete freedom. At first he had attacks of pain lasting 18 hours and recurring every month, but in the last six years the attacks had been occurring every 10 days. During an attack he felt in the stump a "drawing" or lancinating pain lasting two to three seconds and recurring three times a minute; and in the phantom a very disagreeable sensation in the toes and sole as though they were being strongly tickled. There was no neuroma palpable in the stump, but he was taught to percuss some tender areas. He obtained no relief for a month, but continued the percussion three times a day, and thereafter the pain became less frequent and could be dispelled by percussion. After six months he was applying percussion for 10 minutes once a day, and wrote: "The

*This method of local anaesthesia was in use in the fourteenth century (de Mondeville, 1320).

†The "Stanco" vibrator is manufactured by Stanley Cox, Ltd., 11, Gerrard Street, London, W.1.

‡The vibrator stand and the percussor were designed by Dr. E. J. Schuster, and manufactured by Mr. H. G. East, instrument maker, Oxford

phantom makes an attempt to come about once every three weeks now, but it is too feeble to trouble me in any way, and I can usually knock it away in 10 minutes of hammering."

Results of Treatment

The results of treatment carried out as described above are usually highly gratifying. In many cases the first treatment gives relief which is so obvious that the patient quickly becomes an enthusiastic exponent of the method. In others the results are at first less apparent, and, as the patient often at first looks askance at the treatment, considerable time and effort have to be expended in persuading him to continue. Here the advantages of treating the patients in a centre where there is a tradition of cures are obvious.

Though few cases have been under treatment for more than a year the effect of it seems to be better as time passes; in most cases the patient can gradually reduce the number of treatments after some weeks, and in some instances even stop treatment.

For instance, Case 7, nine months after his first attendance, writes: "I do very little hammering these days. Only when it is raining hard or I am very tired or shaky do I need to 'tap,' and then it is to a phantom that seems 'half-hearted' and nothing compared with the feelings of discomfort I had before having treatment."

Case 1 was treated over five years ago in Cairo, and this patient writes from South Africa to say that he has had no further pain in his finger stumps except when on holiday and not using his hands much, when the pain sometimes returns. There is thus no evidence that these pains become resistant to treatment by percussion; indeed, the reverse seems more probable.

In Table II an attempt is made to classify the results of treatment in the 33 cases comprising the main group. Nine of these cases have been entered as deriving no benefit from

TABLE II.—*Results of Treatment in 33 Cases (Definitions as in Table I)*

	Total	Excellent	Good	Improved	Unchanged
No. of cases	33	11	8	5	9
Mean duration of follow-up (months)* ..		6	4	7	—
Range (months) ..		1–11	2–8	4–10	—

* Case 1 (follow-up over 5 years) is excluded.

treatment by percussion. It should, however, be added that there was only one failure among the first 15 cases treated, while in the last 18 there were eight failures. This worsening of recent results is due partly to cases of especial difficulty being referred, and partly to the treatment of some of the later cases being inadequately supervised. One "failure" (Case 26) subsequently obtained complete relief after an operation; this case is described later. It therefore seems that the proportion of failures in this series is higher than it would be in a less selected group. One occasional difficulty in dealing with pensioners depends on their having a vested interest in maintaining a high percentage of disability. There were, however, very few cases in which we felt that this factor seriously interfered with treatment.

Discussion

Although the theoretical prospect of converting a tender neuroma into a painless knot of fibrous tissue by repeated trauma seemed likely enough, the success of our attempts to do this in practice exceeded expectations. It was hard to believe that the well-known effects of pressure or trauma on nerve endings had not previously been fully exploited.

Gordon and Carleton (1923) described a somewhat similar method in a paper entitled "Hysterical Pain," and considered, on the basis of a theory of thalamic function, that the patients must experience pain to improve. Our experience suggests, however, that good results may be obtained whether the treatment is painless or painful, and that the changes observed indicate that the important part of the treatment depends on the physical changes caused at the periphery, in the neuromata and tender scars. Further, it seems clear that, whatever psychological factors there may be, the severe pain usually depends on afferent impulses which originate in the neuromata.

One highly gratifying feature of the treatment is that the patients are often enabled to discontinue drugs they have taken for years, and are again able to sleep without being repeatedly wakened by pain.

The chief complaint of Case 15 was that the pain used to keep him awake at night. There was improvement in this respect within a few days of beginning percussion, and eight months later he wrote: "I have rarely had to use the tapping, and when I have it has only been of very short duration, between three and five minutes. I feel really well and full of energy, and I can safely say when I go to bed that I am going to sleep, and I do sleep well. I really think that nerve is afraid of the mallet."

Dr. John Scarff, of the Neurological Institute, New York, has kindly sent particulars of a patient, a professional man, who after a mid-thigh amputation for embolism 10 years ago had suffered continuous pain. He became dependent on codeine in increasing amounts to enable him to work, until he was taking 20 gr. (1.3 g.) hypodermically each 24 hours. Finally he became exhausted and was obliged to enter hospital. After being treated with prolonged thiopentone he began to hammer the stump neuromata. This brought relief, and two months later he was not only free of pain but had taken no narcotic of any kind since starting the treatment.

The possibility of treating other painful conditions by similar methods has been little explored, except in the case of tender scars, in which excellent results may be expected. Fibrositic nodules are also sometimes quickly rendered painless by a mechanical vibrator.

One point with regard to amputation operations should be mentioned—namely, that our experience suggests that at operation the nerves should not be cut short but left long in an exposed situation. It is often the well-hidden and protected nerves which cause most pain.

In Case 26 we felt obliged to advise disarticulation of a short stump at the shoulder to make it possible to crush the neuromata, which were very high in the axilla, and to leave the nerves as long as possible so they could be easily percussed. He was a man of 65 when he first attended. He had had a minor injury to the middle finger of his left hand in 1915, but the wound did not heal, and a year later the finger was amputated. The hand and forearm were swollen and remained so, and the other fingers became flexed into the palm. The fourth and fifth fingers were amputated in 1925, he had a cervical sympathectomy in 1926, and in 1930 the arm was amputated above the elbow. He had the sensation of a phantom limb after amputation, but it was not painful, and in the last two years he has rarely felt it at all. In 1936 he began to feel a constant burning pain in the whole stump and an aching pain in the left shoulder radiating down the left side of the chest into the left flank. The pain had been relieved for six months in 1942 by excision of neuromata, but the pain had recurred. It was unfortunately impossible adequately to percuss the neuromata, many of which were at or above the apex of the axilla.

At operation the neuromata were not excised but crushed with clamps and left in an easily accessible position over the

chest wall. His pain was relieved immediately by this operation, and, should it recur, treatment by percussion is now much more likely to be successful, as the neuromata are easily reached.

In conclusion it should be emphasized that treatment by percussion has not on any occasion in our experience done harm. In some cases benefit has been apparent almost from the first treatment, but in others considerable perseverance has been required to get the desired relief.

Summary

The treatment of painful amputation stumps by repeated percussion to the neuromata has proved successful in most cases.

Of 33 cases considered suitable for percussion treatment, 19 reported good or excellent results and 5 were improved. There was only one failure in the first 15 cases treated, but in the last 18 cases, some of which were especially difficult, there have been eight apparent failures.

Methods of applying the treatment are described. The neuromata are located as accurately as possible. If they are very tender the arterial supply to the stump is occluded by a sphygmomanometer cuff, as anoxaemia renders them less sensitive. Percussion is done with a mallet and an applicator about 15 cm. long. After several minutes the cuff is removed and percussion continued for 20 minutes. An electrical vibrator may be used in place of the mallet, and is of particular value in treating areas beyond the patient's reach. Cases with cold and diffusely tender stumps should be treated by sympathetic block or section rather than percussion.

Illustrative case histories are given.

We are specially indebted to Dr. E. J. H. Schuster for designing and constructing apparatus, also to several members of the Ministry of Pensions staff for their encouragement with this study, and to Miss Ruth Hurst for her assistance with the treatment of many of these cases at Headington Hill Hall Rehabilitation Centre, Oxford.

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Another highly successful year's working was announced at the annual general meeting on June 6 of the Medical Sickness, Annuity, and Life Assurance Society, Ltd. The chairman, Mr. R. J. McNeill Love, said that when he last addressed the members he had reported on improvements in the policies and policy conditions; and he was now pleased to say that these had produced most satisfactory results. It had been hoped that the new life assurance business might pass the £1,000,000 mark for the first time, and it was gratifying to find that the amount actually achieved was £1,420,734. The figures for the current year indicated that this progress had been fully maintained. A subsidiary company, Medical Sickness Finance Corporation, Ltd., appeared for the first time in the accounts. By the end of last year it had assisted members of the medical and dental professions in the purchase of cars and equipment to the extent of about £100,000. The directors were convinced that this would be a satisfactory investment, especially when there was an increase in the number of cars for the home market. The increase in life assurances effected during the year amounted to £649,614. Claims had increased by £14,646, but were well within the amount expected. The amount paid in sickness benefit was £77,448. The funds of the Society stood at £4,371,026, an increase of practically £330,000.

P.T.A.P.

DETERMINATION OF THE ESSENTIAL Lf DOSAGE

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P.T.A.P. is an integrated diphtheria prophylactic prepared by the adsorption of highly purified toxoid on to pure aluminium phosphate—each prepared separately. Because of this it is possible not only to duplicate accurately any given composition but also to alter, at will, the amounts of both, as well as their ratios. In this we have a means of answering a number of important questions in diphtheria prophylaxis which previously could not be reliably investigated at all.

Of the several questions that required an accurate answer three have now received attention : (*a*) How much mineral carrier is required to produce the maximal antitoxin response ? (*b*) What is the route of choice for inoculation ? (*c*) What is the essential or optimum quantity of toxoid necessary ?

An account of work done to determine the correct dosage of aluminium phosphate carrier for young children has already been described (Bousfield, 1947a, 1947b ; Holt and Bousfield, 1949). This amount was found to be not less than 5 mg. of $AlPO_4$, determined by observing the Schick conversion rate following a single injection. The conversion rate obtained, using 5 or 7.5 mg. of $AlPO_4$, was of the order of 97% ; and this was found to persist for at least 15 months in 95% of the children examined. These figures bear interesting comparison with those of Faragó (1935), who, by using a 1-ml. dose of large-precipitate A.P.T., obtained an overall S.C.R. of 93.5% (4,297 cases) following one inoculation, and furthermore reported no significant decline in the S.C.R. after one year.

We have found the route of choice to be intramuscular, in that the relative effectiveness of the intramuscular route to the subcutaneous is 2.6—that is, in order to obtain the same results, 2.6 times as much $AlPO_4$ carrier must be used by the subcutaneous route as by the intramuscular.

Included in these same reports were the results of preliminary attempts to determine the essential toxoid dosage. No statistically significant differences were obtained when the $AlPO_4$ carrier was maintained constant at 7.5 mg. injected, and the amount of toxoid varied from 30 to 5 Lf per dose ; the S.C.R.s were determined three months after a single intramuscular inoculation (Holt and Bousfield, 1949, Tables III and IV).

As the solution of this question is one of no small importance or interest the experiment has now been extended. For purposes of accurate comparison it is not a reliable procedure to compare uncritically one set of clinical results with another made at a different time or place. Because of this it is a minimum precaution always to arrange that new materials should overlap, in terms of the variable under investigation, with former preparations used in previous experiments.

It is of some importance also to describe the exact procedure used in making the Schick tests. Schick control was invariably used in all work carried out since

midsummer, 1948 (Bousfield, 1948). Burroughs Wellcome Schick toxin and control were used, 0.2 ml. being inoculated intradermally on the flexor surface of either forearm. The tests were read seven days later without any knowledge of the treatment the child had received. The readings are recorded in such a way that negative results are entered only when the reaction, if any, does not exceed approximately 5 mm. in diameter. For the purpose of this work any reaction greater than this is recorded as positive. This routine is exacting, but is fully justified by the quantitative work of Vahlqvist and Högstedt (1949) on the relationship between circulating antitoxin and the Schick-test result.

Investigation of Minimum Amount of Toxoid which will Produce a Reasonable S.C.R.

A series of preparations was made in which the aluminium phosphate content was maintained constant at 10 mg./ml., and the contents of purified toxoid (1,900 Lf/mg. of protein nitrogen) varied from 10 to 1 Lf per ml. These preparations were made from a sample of P.T.A.P. of exactly known titre and one which had matured at room temperature for nine months; this was appropriately diluted with a 10-mg./ml. suspension of $AlPO_4$, to give the desired concentrations of toxoid.

As in previous work, Schick-positive children between their first and second birthdays were employed. A uniform dose of 0.5 ml. was used, the inoculations were made into the deltoid muscle, and two time intervals of observation were adopted. Four weeks after their single inoculation 494 cases were post-Schick tested, and a further 192 two months after injection. The details of the results are shown in Table I.

TABLE I.—*Schick Conversion Rate in Children (aged 1 Year) Using Samples of P.T.A.P. Containing a Constant Amount of $AlPO_4$ Carrier (10 mg./ml.), but Decreasing Amounts of Purified Toxoid (Intramuscular Inoculation, dose 0.5 ml.)*

Time	Dose of Toxoid (Lf) Injected	Post-Schick Test Result			S.C.R. (%)
		+	−	Total	
1 month after injection	5	11	105	116	90·5
	2·5	11	116	127	91·4
	1	37	98	135	72·6
	0·5	45	71	116	61·2
2 months after injection	5	1	50	51	98·0
	2·5	2	49	51	96·1
	1	6	38	44	86·4
	0·5	19	27	46	58·7

The results of work of this kind may be examined in two ways.

First Examination of Results

The easiest and perhaps slightly naïve way is to present them in graphic form, using percentage S.C.R. on one ordinate and dosage of toxoid on the other. This method of presentation is shown in Fig. 1, supplemented by all previous results obtained, working on the same lines. These latter results are given in Table II.

TABLE II

Dose of Toxoid (Lf)	Post-Schick Results			S.C.R. %
	+	−	Total	
5	20	452	472	95·76
10	6	244	250	97·60
15	51	1,677	1,728	97·05
20	5	251	256	98·05
30	9	244	253	96·44
Total ..	91	2,868	2,959	96·92

χ^2, 5 Lf/the rest = 3·33. P = <0·1

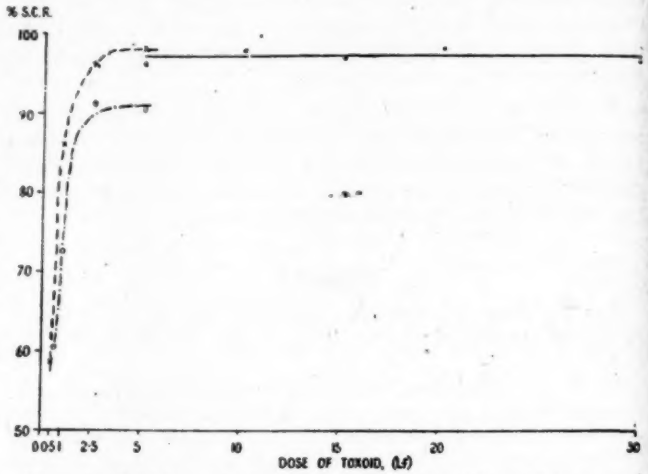

FIG. 1.—Schick-conversion rate in Schick-positive children, aged 1 year, to single inocula of P.T.A.P. containing a constant amount of $AlPO_4$ (5 mg.) and varying amounts of purified toxoid. .——. = previous results Table II. x——x = current results after two months. o——o = current results after one month.

From the graph (Fig. 1) it would appear that the S.C.R. is substantially constant between dosages of about 3 Lf and 30 Lf. If it be conceded that the S.C.R. definitely declines when less than 2.5 Lf of toxoid is used, an approximate evaluation may be made of the critical ratio of toxoid to $AlPO_4$ carrier, which, with those figures, becomes 2.5 Lf/5 mg. of $AlPO_4$, or 0.5 Lf/mg.

These findings—the result of a clinical experiment in immuno-physiology—show an excellent agreement in character with a similar experiment performed in guinea-pigs, in which the critical ratio of toxoid to mineral carrier was found to be approximately 0.2 Lf/mg. of $AlPO_4$ (Holt, 1949). But there seems to be a difference in the amounts of toxoid in the two instances—0.5 Lf/mg. of $AlPO_4$ for children and 0.2 Lf/mg. for guinea-pigs. Although it is difficult to be certain that the difference in these critical ratios is a real one, it would seem that the amount of specific antigen required to convert a normal globulin-producing cell to an antitoxin-producing cell may vary from one animal species to another. Even so, these findings do reveal how very great is the physiological activity of the antigen proper (toxoid protein) when it is administered in this form.

It may be of some interest, at this point, to mention the results obtained in immunizing an exceedingly sensitive adult (combined Schick result) with preparation C (P.T.A.P. Lf 2 and 10 mg. of $AlPO_4$/ml.). This subject tolerated 0.2 ml. of the prophylactic (0.4 Lf). Her antitoxin titre before treatment was <0.005 u./ml. of serum, and four weeks after the one inoculation <0.01 u./ml., but four months after a second 0.2 ml. it rose to 0.2 u./ml. This subject, a difficult one, was therefore adequately immunized with a total of 0.8 Lf of purified toxoid, with no more than a transient (48 hours) feeling of slight local discomfort and malaise. The possibility must be admitted, however, that in view of the combined reaction shown there existed the possibility of contact with *Corynebacterium diphtheriae*, although probably not a virulent strain.

These observations do emphasize how appallingly inefficient and inexpertly prepared some samples of A.P.T. obtained from unusual sources must have been in the early days of the war. Even two doses of such material sometimes failed to give a 50% S.C.R. On the other hand, the law governing the amount of toxoid in present-day prophylactics (A.P.T. or P.T.A.P.) demands a minimum

of 50 Lf/ml. From this we see that there is approximately a tenfold margin of safety (against deterioration) in respect of P.T.A.P. as issued for general use.

Second Examination of Results

A more refined analysis is possible by applying statistical methods which permit an examination of the data in several ways and by using devices for checking the accuracy of hypotheses.

For the purpose of a complete-as-possible analysis of the results described above, it was found best to use all the relevant available data; this was done, and the results are given in Table III.

doses) is 20.151 with 17 degrees of freedom; this indicates a satisfactory homogeneity.

In view of its homogeneity this material seemed to provide a particularly reliable body of data for use (at least in a first-stage analysis) of the Lf-dose-response curve. This curve is plotted as probits of the percentage S.C.R. against log. dose of toxoid (see Carlinfanti, 1948), and is shown in Fig. 2. It will be seen from this curve that there is a tendency towards a maximum response and one that is less than 100%.

An assumption, and one not unreasonable from a biological point of view, is that a small proportion of the child population just does not react demonstrably—

TABLE III.—*Showing all Available S.C.R. Data Following a Single 0.5 ml. Intramuscular Inoculation of Different Samples of P.T.A.P. (All Cases are Children Between Their First and Second Birthdays)*

Dose Toxoid (Lf)	Dose $AlPO_4$ Carrier (mg.)	*p*H	Time Interval (Months)	Post-Schick Result +	Post-Schick Result −	S.C.R. (%)	Total Cases	Probit % S.C.R.	χ^2*	d.f.	P
0·5	5	5·2	1	45	71	60·49	162	5·266	0·0143	1	0·9–0·95
			2	19	27						
1·0	5	5·2	1	37	98	75·98	179	5·776	2·735	1	0·05–0·2
			2	6	38						
2·5	5	5·2	1	11	116	92·70	178	6·454	0·609	1	0·3–0·5
			2	2	49						
5·0	5	5·2	1	11	106						
	5	5·2	2	1	50						
	5·5	5·2	1	4	51						
	6·5	5·2	1	3	81	94·84	639	6·629	7·963	6	0·2–0·3
	7·5	5·2	1	2	86						
	7·5	5·2	3	6	114						
	7·5	5·2	6	6	119						
10	7·5	5·2	3	2	123	97·60	250	6·977	0·171	1	0·5–0·7
	7·5	5·2	6	4	121						
15	5·0	5·2	1	28	883						
	5·0	6·5	1	2	206						
	5·0	5·2	1	4	167	97·05	1,728	6·888	7·934	5	0·2–0·3
	7·5	5·2	3	5	118						
	7·5	5·2	6	2	122						
	7·5	6·5	1	10	181						
20	7·5	5·2	3	1	124	98·05	256	7·064	0·724	1	0·3–0·5
	7·5	5·2	6	4	127						
30	7·5	5·2	3	4	120	96·44	253	6·804	0·001	1	0·95–0·98
	7·5	5·2	6	5	124						
									20·151	17	0·2–0·3

* χ^2 indicates homogeneity within toxoid doses. All χ^2s with one degree of freedom have been corrected for continuity (Yates's correction).

Although these data are of heterogeneous origin, the materials having been used at different times of the year, and were different, apart from the variable under investigation—namely, a slight variation in the amount of $AlPO_4$ injected, some prepared at *p*H 5, others at *p*H 6.5, and the observations made one, two, three, and six months after inoculation—the results are fairly homogeneous. In fact, all internal analyses show no appreciable differences between these variations. If, therefore, there are differences due to the above-mentioned variations, they must be very small, as the total χ^2 between experiments (within toxoid

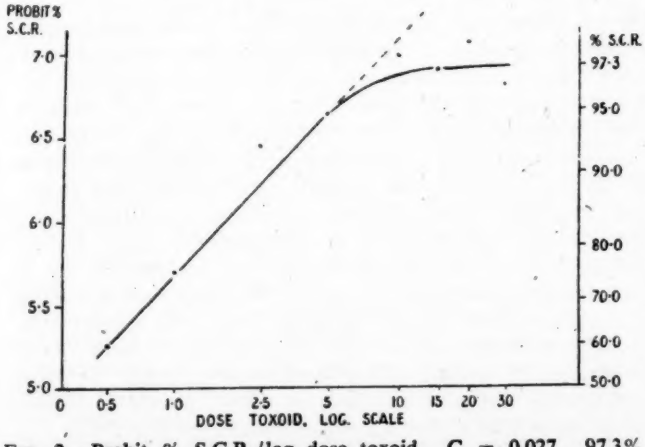

FIG. 2.—Probit % S.C.R./log dose toxoid. C = 0.027. 97.3% convertible, 2.7% non-convertible.

namely, show circulating antitoxin—to any single inoculum, whatever the dose. A similar observation was made by Scheibel (1943) in guinea-pigs, also using diphtheria toxoid. This worker observed that the "non-immunizability" was inherited and in a nearly typical Mendelian manner. It seems, therefore, not unlikely that a similar situation might exist in man, although for the purpose of mass-immunization it does not matter whether the lack of responsiveness in a proportion of the total population is determined genetically or not. It does not follow that the same proportion of refractory subjects will be found following a two-dose system of immunization.

Two well-spaced injections of P.T.A.P. containing 15 or 25 Lf of toxoid with 5 mg. of $AlPO_4$ are now being found to yield virtually 100% S.C.R. two or three months after the second injection.

A study of the responses in individual guinea-pigs to one injection and to two spaced injections of toxoid has revealed that most of the poor antitoxin producers—as judged by their responsiveness to a single inoculation—do respond satisfactorily to a second injection (unpublished work). The adult clinical example referred to above may be quoted as a case in point for man.

If we accept the assumption that a proportion of the child population does not respond to a single inoculum, we may try to estimate this proportion, and test whether this hypothesis fits the whole body of data.

From the point of view of statistical analysis this is a problem closely related to one solved by Finney and by

Fisher for the treatment of dose-response curves in the presence of natural mortality. In our present case the situation is reversed in that instead of a lower asymptote we have an upper one. The method of dealing with this problem statistically is by substituting the residual percentage of Schick positives for the natural "mortality," and then working on the decrease of positives with increasing dosage of toxoid—that is, with a negative regression coefficient. The "maximum likelihood" estimate obtained with Finney's (1949) improved method is $2.7 \pm 0.5\%$ of "non-convertible" children, and the fit of hypothesis obtained by accepting this figure is very good: χ^2 with five degrees of freedom gives a probability of $>50\%$. The curve corresponding to this hypothesis is shown in Fig. 2. Briefly, this analysis suggests, and supports the suggestion, that when an infinite quantity of toxoid is used with 5 or 7.5 mg. of $AlPO_4$ carrier the maximum S.C.R. obtainable (single dose) is 97.3% (±0.5% standard error), and when 10 Lf are used the expected S.C.R. will be 96.8% and with 5 Lf 95.25%.

This statistical analysis confirms the conclusions drawn from the simple % S.C.R./dose toxoid curve in that there is a maximum (<100%) S.C.R. for P.T.A.P. The maximum is reached asymptotically, and in such a way that the advantage of using more than 10 Lf per dose is negligible.

Summary

Schick-positive children in the London area aged 1 year were given one intramuscular inoculation (0.5 ml.) of samples of P.T.A.P. containing 10 mg. of $AlPO_4$ per ml. and decreasing amounts of purified toxoid.

With an inoculation of only 0.5 Lf a S.C.R. of 60% was obtained, and with 5 Lf one of 93.8%.

By employing all relevant data previously obtained, it appeared that a maximum S.C.R. of about 97% was obtainable using a single 5–10 Lf dose, and that this S.C.R. was not exceeded (on the average) if more toxoid were used.

A special statistical examination of all the results also showed that a maximum S.C.R. of <100% is obtainable with a single inoculation of P.T.A.P. (10 or 15 mg. of $AlPO_4$ per ml.). Using an infinite quantity of toxoid this maximum S.C.R. was calculated to be 97.3% ± 0.5%; using 10 Lf per dose, the expected S.C.R. is 96.8%, and with 5 Lf 95.25%.

These maximum conversion rates for a single inoculation are most probably significantly below those following a two-dose method of immunization.

Our thanks are due to Dr. A. Anderson, M.O. of No. 9, Middlesex area, and to Dr. H. D. Chalke, M.O. of No. 7 Division, L.C.C., for facilities in connexion with the above work. The same thanks would have been expressed in the case of the late Dr. Harry Smith, formerly M.O. of No. 1 Division, L.C.C. Grateful thanks are also due to Dr. L. Cavalli, of the Department of Genetics, Cambridge, for his most valuable assistance in the special statistical analyses demanded by the findings of this investigation.

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Dr. Angeliki Tsacona, gynaecologist and obstetrician, and president of the League of Women Scientists of Salonika, is visiting the United Kingdom under the auspices of the British Council. She is studying gynaecological and obstetrical methods in British hospitals, and is particularly interested in the use of anaesthetics in childbirth.

ILL EFFECTS OF THE RADIUM MENOPAUSE*

BY

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Induction of the menopause for non-malignant uterine bleeding is a safe and effective method of treatment, and is much used in the Birmingham School, but the resultant improvement in the patient's health may obscure certain immediate and remote sequelae. In this review attention has been paid to flushing and sweating, loss of libido, and premature senile changes in the genital tract.

In all, 118 cases were examined at an average interval of two years after receiving intrauterine radium (2,400 mg.-hours). The ages of the patients varied from 33 to 58 (average 45). The outstanding symptom after irradiation was flushing, and the cases were grouped according to the following definitions :

(*a*) *Mild Flushing* (commonest).—An occasional sensation of heat and sometimes sweating with an obvious flush of the face and neck. Normal duties are not disturbed and the patient is seldom inconvenienced.

(*b*) *Moderately Severe Flushing.*—From 12 to 20 or more flushes by day severe enough to cause temporarily listlessness and a sense of fatigue. Generalized sweating usually accompanies flushing, and this often causes the patient to waken from sleep with her night attire uncomfortably wet.

(*c*) *Severe Flushing* (rare).—A severe disability causing insomnia, listlessness, and fatigue (20 cases from *b* and *c* were already under stilboestrol therapy in this series).

The results after radium were : severe flushings, 5 (4%); moderately severe flushings, 53 (45%); mild flushings, 51 (44%); and flushings absent, 9 (7%).

The incidence of serious and persistent attacks of flushing after irradiation is three times the normal, or approximately the same as that following surgical castration (Table I).

TABLE I.—*Comparison of Menopausal Flushing**

	Pre-menopausal	Post-menopausal	Radium	*X* rays	Castration	Hyst. Only
No. of cases ..	74	78	118	17	43	67
Incidence of severe or moderately severe flushing	7 (9%)	13 (17%)	58 (49%)	10 (59%)	20 (46%)	1 (1·5%)

* Comparative figures from previous report (McLaren, 1941).

On the other hand, simple hysterectomy with conservation of ovarian tissue is not followed by the immediate onset of these symptoms. Moreover, the reservation of radium for patients nearer to 50 than 40 years of age does little to alter the incidence of severe flushing (McLaren, 1941).

Spontaneous Cure of Flushing.—It is commonly held that the passing of a few months will cure flushing, and that a little encouragement is all that is required from the doctor. With this in mind we carefully investigated 71 patients who had completed the radium menopause for periods up to four years (average two years), to find that a spontaneous cure had resulted in only 13 cases, while four appeared to be more seriously affected with the passage of time. The remaining 54 cases (76%), however, continued to have flushing of unabated severity, so that "radium" flushes are by no means transient.

*A postgraduate lecture delivered at the Royal College of Obstetricians and Gynaecologists on November 18, 1949.

Sex Function After Radium.—Before any pelvic operation or treatment by radium or *x* rays there arises in the patient's mind the question, "Shall I be able to continue my normal married life?" At the time of writing no adequate controls are available—that is, it is not known how many women become sexually anaesthetic after the normal menopause. It is considered, nevertheless, that the sudden loss of libido and the onset of sexual dysfunction after radium should be recorded.

Method of Study

The difficulties in obtaining accurate information and the degree of selection of cases were as follows: (1) Before radium treatment uterine bleeding had often caused both physical and mental disturbances, so that sometimes sexual activity had been minimal for months. (2) When patients could not be questioned about sex function—for example, embarrassed patients, unmarried women, widows, or women with unfit husbands. (3) When the patient was obviously telling us what she thought might be expected of her—for example, when a woman, alleging normal sex life, was found to have a painful lesion of the vulva or vagina. (4) Lastly, in all cases the sexual performance of the male partner could only be guessed at from questioning the patient.

I interviewed all the patients in privacy, and after a general talk about weight, flushings, amenorrhoea, etc., the subject of sexual function was tactfully opened. After ascertaining that the husband was healthy, I explained that we were anxious to know if their married life had been improved or in any way altered since the cure of menorrhagia. In various forms the following questions were put:

1. "Before treatment, how frequently did intercourse take place—twice weekly or oftener?" Very often the question "after radium" was answered by a shrug, "Oh, I quite lost interest," or, "It became quite hopeless."

2. The orgasm was also discussed in the simplest terms. "Do you get complete satisfaction, just like your husband?" "Do you get satisfaction always, or once every two or three attempts?"

Very occasionally the male partner was accused of being precipitate or ineffective, but more often the patient herself admitted the sudden onset of sexual anaesthesia, sometimes aggravated by loss of secretion at the vulva.

Material

Half the patients were from Aberdeen and district and half from Birmingham and the Midlands. Information was available from a total of 236 cases. The variable ages of the patients were:

Group A: Aberdeen (116 Cases)

Age	No.	Age	No.	Age	No.	Age	No.	Age	No.
27	1	40	3	45	8	50	4	55	3
34	1	41	4	46	10	51	12	56	1
36	1	42	9	47	12	52	3	57	1
37	2	43	7	48	4	53	6	58	2
38	4	44	6	49	9	54	2	61	1

Group B: Birmingham (120 Cases)

Age	No.	Age	No.	Age	No.	Age	No.	Age	No.
33	1	38	1	43	9	48	12	53	9
34	1	39	4	44	5	49	6	54	5
35	1	40	3	45	5	50	4	55	2
36	2	41	9	46	9	51	5	56	2
37	2	42	7	47	10	52	5	58	1

The following is an outline of the degree of selection. *Sex Urge:*—Computed from desire for intercourse or libido plus frequency of intercourse; 76 patients could provide no information (unmarried, widows, those with unfit husbands). The evidence was discarded as unreliable in 17 and accepted in 143. *Orgasm:*—No information, 79; evidence discarded, 31; reliable information available, 126.

Effect of Radium on Sex Urge

Before Radium.—Good, 11 (7%); moderate, 66 (46%); slight, 43 (30%); absent, 23 (16%)—a total of 143 cases. In other words, 66 (46%) of our cases either lacked or had only slight libido before treatment with radium. The remaining 77 cases (54%), however, had normal sexual desire and would therefore have reason to complain if they found themselves anaesthetic or completely disinterested as a result of radium treatment.

After Radium.—(1) *11 patients with "good" sex urge:*—Unchanged, 7 (64%); depressed to "slight," 1 (9%); complete loss of libido, 3 (27%). (2) *66 patients with moderate sex urge:*—Maintained, 15 (23%); depressed to "slight," 9 (13.5%); complete loss of sex urge, 42 (63.5%). (3) *43 patients with "slight" sex urge:*—Improved to "moderate," 2 (4.5%); unchanged, 14 (32.5%); complete loss of sex urge, 27 (63%). (4) *23 patients without sex urge:*—Unchanged, 23.

To summarize: sex urge already depressed or lost in about 50% of cases suffered further as a result of radium castration; for of 77 patients estimated to have normal sex urge 55 (71%) suffered a marked diminution or found themselves entirely without libido.

Effect of Radium on the Orgasm

Before Radium.—Orgasm usually or almost always, 65 (51.6%); orgasm occasionally, 30 (23.8%); orgasm never achieved, 31 (24.6%)—a total of 126 cases. In other words, 61 (48.4%) were unable to achieve the orgasm or did so only occasionally, while 65 (51.6%) normally achieved the orgasm, and would therefore have reason to complain if this faculty were lost as a result of radium castration.

After Radium.—(1) *65 patients who normally achieved the orgasm:*—No effect (orgasm maintained), 28 (43%); depressed (occasional orgasm), 14 (21.5%); absent, 20 (30.7%); doubtful, 3 (4.6%). (2) *30 patients who occasionally achieved the orgasm:*—No effect, 11 (36.7%); complete loss of orgasm, 19 (63.3%). (3) No orgasm before or after radium, 31 (24.6%).

As will be seen, the orgasm, already infrequent or absent in 61 cases (48.4%), was further affected by radium, so that 34 patients (52%) who normally achieved the orgasm found this no longer possible.

Dyspareunia after Radium.—Although the commonest symptoms after the use of radium were sudden loss of libido and a loss of normal genital sensation, dyspareunia was also present in at least 10% of cases. Occasionally patients noticed that lack of normal vulvar secretion at coitus aggravated the condition.

Premature Ageing of the Genital Tract after Radium

The Vulva and Introitus.—Vulvitis secondary to vaginitis was observed in 2 out of 82 cases, but the introitus appeared abnormal in 7 out of 72 cases—in fact, in 5 patients pain prevented the passage of a small speculum.

Atrophic Vaginal Changes.—Total number of Cusco examinations, 68; bleeding mucosal spots, 11 (16%). Clinically, we labelled these spots "senile vaginitis,"

TABLE II.—*Abnormal Introitus*

Case No.	Age	Condition of the Introitus
53	48	Red and inflamed but not painful
184	36	Painless telangiectasis
185	48	Involved in senile vaginitis
188	52	Perineo-vaginal junction split and bled easily
187	39	Tender inflamed introitus
263	58	Tender; periurethral oedema present
103	53	Tender inflamed introitus

although "pre-vaginitis" would perhaps be a more accurate term; for in our experience it requires the irritation of, say, a pessary before purulent vaginitis develops. In Table III

TABLE III.—*Vaginal Spotting*

	Normal Menopause		Post Radium		Castrate		Simple Hysterectomy	
	Average age, 63		Average age, 46		Average age, 45		Average age, 40	
	Red Spotting		Red Spotting					
	Macro.	Biopsy	Macro.	Biopsy	Macro.	Biopsy	Macro.	Biopsy
No. of cases	57	23	68	88	36	27	75	34
Atrophic or senile ..	15 (26%)	8 (35%)	11 (16%)	13 (14%)	4 (11%)	7 (26%)	0 (0%)	1 (3%)

comparative figures from a previous report (McLaren, 1941) show clearly that surgical castration, like radium, may produce senile mucosal spotting, whereas functional ovarian tissue prevents it.

The Cervix.—The following is a summary of the effect of radium on the cervix: (*a*) atrophy down to the merest rudiment, 27 of 100 cases (27%); (*b*) red spotting on the portio, 9 of 75 cases (12%); (*c*) flat erosions without mucopus, 10 of 131 cases (13%); (*d*) cervical mucus, 56 cases: absent or traces of mucus, 33 (59%); small amount of mucus, 23 (41%). A great variety of bizarre-shaped cells appear in the endocervical canal after irradiation, while radium-vacuolation was occasionally observed in the cytoplasm even six months after treatment. The commonest cells were the polymorph and the endocervical cell, 7 to 10 μ in diameter and possessing a relatively large nucleus. Large "fibre" cells 120 to 180 μ in length with rod-shaped nuclei and small squamae were also seen. Mucus in crenated or web-like form replaced the clear mucus of the sex-mature cervix. On one occasion, however, a small clear piece of mucus was found to contain abundant spermatozoa.

The Urethra.—In a previous report on patients over 60 we noted that in the normal menopausal urethra the external urethral orifice might occasionally show a tongue-like projection of mucosa. These protuberant areas were painless and did not bleed; they were considered to be physiological and not true caruncles. No such appearances were seen in this series. The recent work of H. G. Hanley (1944–5) on menopausal trigonitis and urethritis led us to search for this condition, but only two cases with frequency, sterile urine, and typical trigonal lesions have so far been discovered. (Mr. Guy Baines undertook the cystoscopic examinations.) Urethral smears were taken from 47 smears and compared with the normal. Only three smears could be labelled senile or immature with deep or undifferentiated small cells. The remainder were within normal limits—namely, clumps of intermediate cells (40 μ in diameter), small squamae, globular cells with long nuclei, leucocytes, free nuclei, and so on. Evidence of urethral irradiation was occasionally seen in cytoplasmic and nuclear vacuolation up to six months after treatment.

Vaginal Smears Reflecting Ovarian Activity

Vaginal smears can forecast the actual mucosal histology (1) with adult or mature cells (= adult differentiated epithelium), and (2) with very small or immature cells (= senile undifferentiated epithelium). Most menopausal smears were neither adult nor completely senile. Many smears had a large number of intermediate cells, and though they cannot always be correlated with the histology of the mucosa they do portray a degree of senility or lack of maturity. With these limitations of the vaginal smear in mind, 67 were classified as follows: grossly senile (grade I), 2; moderately senile (mixed or grade II), 44; menopausal clumping (grade III M), 19; and adult, as in sex-mature women (grade III), 2.

Seventy per cent. of the smears therefore had varying numbers of intermediate or senile cells. The 19 smears showing menopausal clumping resembled mid-pregnancy smears, and, indeed, in one case (after 17.5 g. of vitamin E, however) the pregnancy-like or "luteal" smear was found at laparotomy to correspond to the presence of a post-menopausal luteal cyst of the ovary (McLaren, 1949). These menopausal "pregnancy-like" smears appeared to have smaller flat cells lying superficial to deeper and larger cells. It is not suggested, however, that the hormone levels of pregnancy and the menopause are similar, although the resulting vaginal smears may be alike.

The presence of deeper mucosal cells in 70% of the smears probably results from a deficiency of ovarian hormones, and this is supported by the fact that flat squamae replace less mature cells after small doses of stilboestrol. The other possibility is that senile (menopausal) cells result from an excessive level of androgens or a new and increased response to a hormone of this type which is capable of depressing the maturation of the vaginal mucosa. Whatever the exact hormone pattern which produces senility or maturity in cell smears, there is no relation between the cytology and the severity of symptoms; so that patients with no flushings, for instance, produce senile smears and, vice versa, patients suffering intensely from flushing may have a relatively adult cell smear.

Miscellaneous Findings

Ignorance of the diagnosis and the aim of treatment was striking both in this series and in the Aberdeen group—for example, eight patients still practised contraception, while several admitted that they thought they had had cancer. One patient had amenorrhoea and a large abdomen, and was lactating freely. She was busily occupied in knitting baby-clothes for her pseudopregnancy.

Discussion

From the foregoing, the radium menopause is apparently free from any severe delayed effects, but flushings, sexual anaesthesia, and mild involutional changes in the genital tract may be important if not severe disabilities. Most of these ill effects can be improved by the use of stilboestrol. Indeed, 19 of our patients were already under stilboestrol treatment for flushings by their own doctors. However, 40 patients were suffering the discomfort of flushings with loss of sleep, etc., apparently content with the assurance that the effects of the "change" are inevitable and would soon cease.

Flushing and Sweating

Fifty per cent. of normal women approaching the menopause experience occasional flushes or sensations of heat, but in only one case in ten are they of serious type. The figure rises to 17% after the menopause and to 50% after radium or castration (McLaren, 1941). This figure is in agreement with that of Schmitz and Towne (1947), who recorded 48% with "serious menopausal manifestations" in 412 cases treated by *x* rays or radium.

To the severity of "induced" flushes must be added their suddenness of onset. In contrast to this, the normal woman is usually given time to become used to flushes, which may or may not slowly increase in frequency and intensity.

The similarity of the incidence of flushing after radium and castration raises the question—so far unanswered—

of the aetiology of flushing. Does radium destroy the ovary, or is its chief effect on the endometrium, finally preventing it from reacting to hormone stimulation? There seems as yet no clear answer, though probably both endometrial and ovarian irradiation are important in producing amenorrhoea. Ovarian damage and reduced secretion of follicular and luteal hormones (as reflected, for example, in the vaginal smears) may permit overaction of the anterior pituitary, but why this leads to uncontrolled flushing and sweating is not clear.

Loss of Libido

Do women normally become disinterested in sex matters at the menopause? I was somewhat discouraged in several attempts to find a suitable group of (gynaecologically) normal patients—for example, in the surgical wards. So far no controls are available to compare with patients who have been irradiated. Nevertheless, it seems an important finding that libido practically disappeared in well over half the patients under review. The cause of sexual anaesthesia would appear to be more than a temporary effect of irradiation on the sensory-nerve endings in the genital tract, for that might be expected to resolve in time. Ovarian sclerosis with loss of ovarian hormone is another possibility, but it is well known that some castrated women may continue to have a normal and satisfactory married life. The mere fact that the patient has amenorrhoea and knows that she can no longer bear children may, however, be the main factor in disturbing normal sex function.

There seems little doubt, therefore, that radium treatment quickly leads to sexual anaesthesia in 50% of women with normal sexual feelings. It may be that a similar group of patients passing through the normal menopause would likewise find themselves without interest in sex matters, but that does not detract from the fact that radium has caused this *prematurely*.

If, when adequate controls are available, it is found that the normal menopause also leads to sexual anaesthesia in a high proportion of cases, that will provide no support for the induction of the menopause except when it is obvious that no other method of therapy is effective. The development of sexual anaesthesia is a serious matter whether inevitable in the normal menopause or not, and to avoid it our future efforts must obviously aim at a method of controlling haemorrhage short of induction of the menopause.

Premature Involution of the Genital Tract

The occurrence of two cases of vulvitis, five with painful lesions of the introitus, and 11 with red "blood spots" on the vagina perhaps does not portray a picture of serious clinical lesions. But add the fact that dyspareunia was present in at least 10%, and that many of the patients suffering from newly developed sexual dysfunction no longer had Bartholin's secretion at coitus, and it will be obvious that radium does more than simply produce therapeutic amenorrhoea.

Mucosal Spotting.—The passing of a Cusco speculum with distension of the vagina seldom causes punctate areas of bleeding in the vaginal mucosa before the menopause, although in a previous study in normal post-menopausal women in the sixth and seventh decades the condition was found to be quite common—namely, 15 out of 58 (26%) (average age 63). Moreover, in younger women, after surgical castration, similar vaginal spots were found in 11% of cases (McLaren, 1941). It is not possible to say how many years must elapse before these atrophic changes become common in the normal woman, but the appearance of "senile spots" in 16% of cases after radium treatment (aged about 45) is unusual and almost certainly it is a consequence of irradiation. Since small doses of stilboestrol cure the condition it seems likely that lack of ovarian hormones is in fact the cause, and this is borne out in Table III, which clearly shows that conservation of ovarian tissue at hysterectomy prevents, or at least postpones, involutional changes in the vagina. The histological appearance of these "blood spots" is typical, whether on the portio or in the vagina—namely, the superficial epithelium is missing, so that only a few layers of small epithelial cells separate the lumen of the vagina from the submucosa. At the site of the epithelial defect there is a clustering of round cells, but no marked dilatation of blood vessels such as one sees in true senile vaginitis.

The red spotting of the vagina therefore seems to represent a deficiency of ovarian hormones and constitutes a potential rather than an actual disability—that is, it may be only after insertion of a pessary, or after coitus, that a true senile (purulent) vaginitis develops.

The Cervix.—In cases of persistent uterine bleeding in which either radium or surgery would suffice, after curettage has excluded cancer of the uterus, the scales are often tipped in favour of surgery by the presence of a hypertrophic eroded cervix from which excessive amounts of mucopus exude. The choice of surgery implies that the cervical condition will not be cured by radium, but, in fact, in our observations we have never seen a cervix after the radium menopause which produced excessive quantities of mucopurulent discharge. On the contrary, after radium treatment the cervix secretes little or no mucus and becomes less bulky, even atrophic. It is important, therefore, in assessing a clinical case to recognize that the radium menopause will cure what seems to be an unhealthy cervix and relieve symptoms arising from mucopurulent cervical discharge.

Comment

Apart from emphasizing the effects of castration by radium or any other method, our investigations do not answer the difficult clinical problem of selecting the safest and best method of treating a specific case of simple menorrhagia at or near the climacteric. After diagnostic curettage it is often good practice to delay a decision on final treatment, sending the patient to a convalescent home, where rest, fresh air, iron therapy, and so on may continue to improve her general condition.

Especially in metropathia, it is not uncommon for temporary, or even permanent, recovery to follow these simple measures. Very often, however, even after attempts at control with hormone therapy, a decision has to be given on treatment aimed at producing amenorrhoea. The definite morbidity and mortality of hysterectomy *versus* the safety and simplicity of *x* rays or radium is a lengthy subject which will not be discussed here. If, however, irradiation is chosen (and it rightly finds favour in the Birmingham school for certain cases), it is clear that several years of follow-up should be planned. The need for this is exemplified by the fact that, although 19 patients had reported menopausal flushings and were under hormone treatment by their own practitioners, 40 were not being treated, to say nothing of those who obviously required help in restoring their normal married life.

It seems logical and practical that follow-up examinations should fall to the gynaecologist who induced the menopause rather than to the patient's private doctor, who may or may not have retained the report on the pelvic pathology. If patients are seen at three-monthly or four-monthly

intervals for three years, or at least given the opportunity of visiting the clinic if they have any symptoms, severe flushing and minor genital lesions would be diagnosed and a correct dosage of stilboestrol established. By these simple measures most of the criticism levelled at radium could be met and further support given to it as a safe and effective agent in dealing with intractable bleeding at the menopause.

Summary

Severe or moderately severe flushing may persist for months or years in 50% of cases after the radium menopause (three times the normal incidence).

Only 50% of patients had interest in sex matters before treatment. Of the remainder every other case quickly became sexually anaesthetic after radium treatment. (No "controls" are available.)

Premature senility of the lower genital tract may follow soon after radium—for example, 5 out of 72 had a tender inflamed introitus, and 11 out of 68 had "pre-vaginitis" (red spots).

Responsibility for detection and treatment of the effects of radium rests with the gynaecologist rather than with the practitioner.

This report has been read and criticized by Professor H. N. Lloyd, Mrs. B. M. Willmott-Dobbie, Professor Dugald Baird, Dr. John Hewitt, and Dr. A. C. Crooke. Although unable to answer all the points they raised, it is a pleasure to acknowledge their help and useful suggestions. My thanks are also due to Sister M. Scotwell and to our technician, Miss M. E. Attwood, for their assistance in preparing this report.

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OBSERVATIONS ON THE TREATMENT OF THYROTOXICOSIS

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There is much diversity of opinion regarding the treatment of thyrotoxicosis. Discussion still centres mainly on the relative merits of thyroidectomy and thiouracil treatment. Neither of these methods can, however, be regarded as wholly satisfactory, and no one would claim invariable success with either. An appreciable proportion of patients are found to relapse after either form of treatment; neither is completely devoid of risk, and there is the possibility, particularly after surgical treatment, of such sequelae as malignant exophthalmos or myxoedema. It is of course recognized that complete remission of thyrotoxic symptoms is obtained in a large number of cases treated either surgically or medically.

Astwood (1948), reviewing 400 cases treated with thiouracil, found that 85% of cases obtained satisfactory remission. Carrick Robertson (1948) noted improvement with the use of this drug in 62% of patients under the age of 21, but only in 43% of a series of 116 cases of all ages, while he claimed almost universally successful results with thyroidectomy. On the other hand, Goldman, cited by Astwood, obtained lasting relief in only 41.8% of cases treated surgically, and Vander-Laan and Swenson (1947) considered the results of thyroidectomy wholly satisfactory in only two-thirds of their cases.

Despite the satisfactory results not infrequently obtained in the treatment of thyrotoxicosis, it is apparent that the current methods are not always successful and that relapses are not uncommon. The purpose of this paper is to inquire into the circumstances which might determine this variability in response to therapy. The investigation is based on the examination of 265 patients referred to me on account of suspected thyrotoxicosis.

Diagnosis of Thyrotoxicosis

While the frank thyrotoxicosis of typical Graves's disease is easy to detect, many cases present difficulty in diagnosis. The recent method of studying excretion of radioactive iodine in the urine has emphasized rather than eliminated this difficulty, as it has shown that there are many "borderline" or doubtful cases. In any case of suspected thyrotoxicosis, nervousness is a feature. The combination of nervousness and thyroid enlargement may be wrongly taken to indicate thyrotoxicosis, as the thyroid may not be overactive although large, while, particularly in men, marked hyperthyroidism or thyrotoxicosis may exist with but slight increase in the size of the gland. Exophthalmos may occur without thyrotoxicosis and may be aggravated by thyroidectomy. Tachycardia is commonly found in nervous patients, whether thyrotoxic or not. Auricular fibrillation in a heart otherwise apparently normal is probably most commonly the result of thyrotoxicosis, but the latter condition may be quiescent although the cardiac irregularity persists. The B.M.R. is certainly raised in thyrotoxicosis, but it may be extremely difficult to obtain a truly basal estimation in a tense, nervous patient, and, in such, high figures may be recorded even in the absence of hyperthyroidism. While the blood cholesterol is commonly below normal its value is too variable to be of much diagnostic help.

Recognizing these difficulties, it is not surprising that in by no means all the cases in the present series could the diagnosis of thyrotoxicosis be accepted. Of the 265 cases,

TABLE I.—*Analysis of 265 Cases Referred to Clinic Suspected to be Suffering from Thyrotoxicosis*

Group	Female	Male	Total
A. Thyrotoxic	116	28	144
B. Goitrous but not thyrotoxic ..	91	2	93
C. Neurosis—no goitre or evidence of thyrotoxicosis	22	6	28
	229	36	265

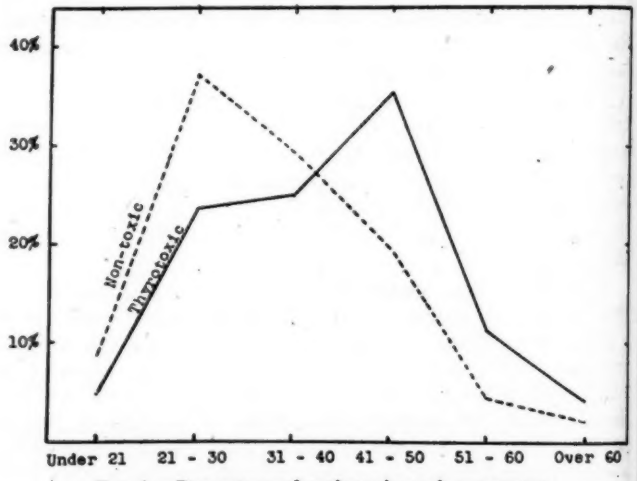

FIG. 1.—Percentage of patients in each age group.

as shown in Table I, only 144 were considered toxic, and 93, although having some degree of thyroid enlargement, non-toxic. The remaining 28 cases had no goitre and no symptom other than nervousness; these have been classified as "neurosis." The number of patients in the "non-toxic" group is so high relative to those in the toxic group that it might be considered that too rigid criteria were demanded for a diagnosis of toxicity. Circumstantial evidence in favour of the correctness of the classification is found in the incidence of cardiac arrhythmia among the toxic cases. As shown below, the incidence of this complication in the present series was found to be somewhat lower than that noted by other observers, which is contrary to what might be expected had the grouping been too highly selective. It may, however, be significant, as is considered later, that the average age of patients in the non-toxic group was less than in the toxic patients (Fig. 1).

Results of Treatment

Of the 144 thyrotoxic patients 116 were women. The age of the patients is shown in Fig. 2. It is seen that among women the largest age group (comprising 33.5%)

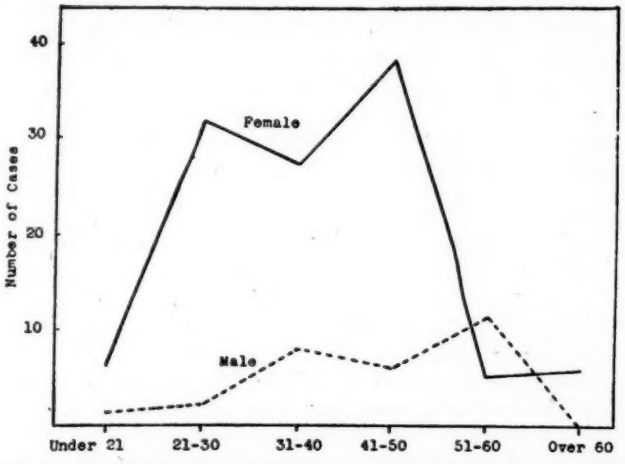

FIG. 2.—Sex distribution of thyrotoxic patients in each age group.

was at the time of the menopause, while in men the peak (42%) is reached a decade later.

All these patients were treated with methyl-thiouracil, with two exceptions—one who was found to have a persistently low white cell count and for whom it was considered thiouracil might therefore be contraindicated, and another who for social reasons could not attend for the supervision necessary with medicinal treatment. The patients treated with thiouracil have all been observed for at least 18 months. The results of treatment are summarized in Table II. A satisfactory remission of symptoms has been obtained in 85 cases, of which 76 have ceased treatment for more than 12 months. There are 50 patients still receiving the drug, but it is anticipated that a considerable number of them will be able eventually to discontinue it. Thyroidectomy was performed on seven cases following a period of thiouracil treatment. In five of these complete remission of symptoms had been obtained and operation was carried out, for cosmetic reasons, at the patient's request. One patient elected thyroidectomy before satisfactory control had been obtained; while another, who had already undergone thyroidectomy on two occasions, so readily developed marked leucopenia each time thiouracil therapy was attempted that she had to be referred once more for surgical treatment.

TABLE II.—*Analysis of Cases Treated with Thiouracil*

Age Group	Total Treated	Off Treatment		Still on Treatment		Subsequent Thyroidectomy
		More than 12 Months	Less than 12 Months	More than 12 Months	Less than 12 Months	
Under 21	7	4 (1)	—	1 (1)	1 (1)	1
21–30 ..	34	19 (2)	4	9	1 (1)	1
31–40 ..	36	20	2 (1)	14 (3)	—	—
41–50 ..	43	23 (5)	2 (1)	14 (2)	—	4
51–60 ..	16	8	—	8 (2)	—	—
Over 60	6	2	1 (1)	2	—	1
	142	76 (8)	9 (3)	48 (8)	2 (2)	7

The figures in parentheses indicate the number of patients who had relapsed after a previous course of thiouracil.

Relapses

It will be seen from Table II that 21 cases relapsed after treatment with thiouracil. These had received a course of treatment averaging 13 months, and this had been followed by a period of remission, the average duration of which was eight months; thereafter thiouracil was resumed. Eleven patients have again had satisfactory remission of symptoms and have been able to abandon the drug, eight for more than 12 months; the remainder are still receiving thiouracil.

Experience showed that patients who had previously undergone thyroidectomy were more difficult to control and that they tended more readily to relapse if thiouracil therapy was stopped after control had been effected. This is in accord with the findings of Cookson and Staines (1947), who, after treating seven similar cases for 18 months, obtained remission in only two. In the present series there were 14 such cases, the effect of treatment on which with thiouracil is summarized in Table III. It is seen that 10 of

TABLE III.—*Thiouracil Treatment of Thyrotoxic Patients Who Had Previously Undergone Thyroidectomy*

Age Group	No. Treated	Off Treatment	Still on Treatment	Thyroidectomy Repeated
21–30 ..	2	—	2 (1)	—
31–40 ..	2	—	2	—
41–50 ..	9	2 (1)	6 (3)	1
51–60 ..	1	1	—	—
	14	3 (1)	10 (4)	1

The figures in parentheses indicate the number of patients who had relapsed after a previous course of thiouracil.

these are still receiving the drug (in four cases it has been administered continuously for four years). The case submitted to repeat thyroidectomy is that referred to above in which there was marked sensitivity to thiouracil as indicated by severe leucopenia.

Comparison is made in Table IV between the results on patients treated initially with thiouracil and on those to whom the drug was administered after previous thyroid-

TABLE IV.—*Effect of Methyl-thiouracil Treatment on Patients (A) Without, and (B) After Previous Thyroidectomy*

	No. Treated	Off Treatment	Still on Treatment	No. of Relapses	Subsequent Thyroidectomy
A	128	82 (64%)	40 (31%)	16 (12·5%)	6 (5%)
B	14	3 (21%)	10 (71%)	5 (36%)	1 (7%)

ectomy. In the former group the relapse rate was 12.5%, while in the latter it was 36%. Of those treated only with thiouracil 64% are in a state of remission after abandonment of the drug. A considerable number of those still under treatment will, it is anticipated, come into this category later, and, even allowing for the possibility of some relapses, it would seem a fair estimate that at least 75% of the cases treated will have satisfactory remission of symptoms after stopping thiouracil. On the other hand,

certain cases seem to require treatment for an indefinite period. This applies particularly to the post-thyroidectomy patient; of such cases in the present series 71% appear to be of this type.

Cardiac Arrhythmia

Brief reference may be made to this complication of thyrotoxicosis. As shown in Table V, auricular fibrillation was noted in 16 cases (11.1%). One patient was treated surgically; of the remainder treated with thiouracil 11 (73%) regained normal rhythm, three requiring quinidine in addition. These results are comparable with those of other observers, which are summarized in the table. As might be expected, the higher the age group the greater was the proportion of patients found to suffer from auricular fibrillation (Table VI).

TABLE V.—*Incidence of Auricular Fibrillation and its Control with Medical Treatment*

	No. of Cases	Cardiac Arrhythmia	Rhythm Restored
Various authors, 1944–6* ..	268	40 (15%)	27 (67·5%)
Cookson and Staines (1947) ..	95	16 (17%)	8 (50%)
Clarke (1948)		6	3 (50%)
Goodwin (1949)	144	28 (19%)	13 (46·5%)†
Vérel (1949)	62	10 (16%)	9 (90%)
Present series	144	16 (11·1%)	11 (73%)

* Nussey (1944), Grainger *et al.* (1945), McGavack *et al.* (1945), Cookson (1945), Wilson (1946). † During this investigation into the effects of thiouracil, quinidine was not used.

TABLE VI.—*Age Incidence of Auricular Fibrillation in Thyrotoxic Patients*

Age Group	No. Showing Arrhythmia	Percentage in Each Age Group	Sinus Rhythm Regained	Arrhythmia Persists
Under 21 ..	0	0	—	—
21–30	0	0	—	—
31–40	1	3	1	—
41–50	6	14	4	2
51–60	5	31	4	1
Over 60	3	50	2	1

Complications of Treatment

Some degree of leucopenia was commonly encountered, but was rarely sufficient to call for discontinuance of thiouracil. There were, however, two fatalities—one patient, a young girl who had been treated with thiouracil and had remained well thereafter for several months, relapsed. It was suggested to her doctor that she should again be given methyl-thiouracil as an out-patient. She did not return to the clinic, and it was later discovered that she had developed severe sore throat, and, suspected to be suffering from diphtheria, had been removed to an isolation hospital, where she died soon after admission, throat swabs proving negative for that infection. It seems certain that her death was attributable to acute agranulocytosis.

The other patient, a middle-aged woman, developed marked leucopenia, and thiouracil treatment was stopped. She was kept under observation; folic acid and other therapeutic agents were tried, but the white cell count remained persistently low. More than a year later, although no further thiouracil had been administered, she suddenly developed severe epistaxis and died; necropsy revealed very marked hyperplasia of the bone marrow and splenomegaly, compatible with hypersplenism. Other toxic manifestations of this form of therapy were encountered in mild degrees, but did not interfere with treatment. One strange sequel, which does not seem to have been reported previously, was noted in two male patients who, after thyrotoxicosis was controlled, grew hair on areas of scalp which had been bald for years.

Psychiatric Aspects of Thyrotoxicosis

While it is true that a large proportion of thyrotoxic patients obtain satisfactory remission of symptoms, whether treated surgically or with thiouracil, it is apparent that they vary greatly in the manner in which they respond to treatment and in their liability to relapse. Some factor must exist to explain these differences.

A hereditary tendency is found in many patients. In the present series of 144 thyrotoxic patients a familial history was obtained in 22 (15.3%). In the non-toxic group of 93 patients a familial history was given by 11 (11.8%), while no patient in the third "neurosis" group gave such history. It has been suggested by Bartels (1941) that a defect, probably of the thyroid, is inherited. While this possibility cannot be denied, it is conceivable that a thyrotoxic mother may so affect the environment of the child that the latter may develop emotional disorder which may prove to be the background for the development of thyrotoxicosis.

Although for many years considered as a possible precipitating factor of thyrotoxicosis, emotional disturbance as the essential cause of the disorder has not gained universal acceptance. Langdon Brown (1932) wrote: "I am more and more impressed with the influence of emotion in the causation of Graves's disease." On the other hand, it has been postulated by Linnell and Greene (1947) that the essential lesion is in the hypothalamus, which, it is suggested, becomes hypersensitive and reacts to even a normal blood thyroxine. Dealing with the latter hypothesis, Means (1949) asks why this change in sensitivity should occur. It seems possible that if altered function of the hypothalamus is established the cause may be attributable to emotional influences on it.

Less attention appears to have been given to psychological disturbances in the treatment of thyrotoxicosis. Kiene and Dixon (1931) examined 15 patients who had previously undergone thyroidectomy and, concluding that recurrence of symptoms would not occur if nervous tension could be relieved, recommended complete psychiatric study of all cases of hyperthyroidism. Such a study was made on 200 thyrotoxic patients by Conrad (1934), from which she formed the opinion that therapy should include both means, such as partial thyroidectomy and also psychiatric guidance. The value of the latter form of treatment in restoring these patients to useful satisfactory life has recently been advocated by Lidz and Whitehorn (1949).

In the treatment of the patients in the series under review it soon became apparent that continuing emotional disturbance was always to be found in those who proved difficult to control. At this time the services of a psychiatrist, Dr. Adam Milne, became available, and he co-operated in the work of the thyroid clinic. His assistance in elucidating the emotional difficulties and in advising about their solution was invaluable.

While the association of physician and psychiatrist in the treatment of thyrotoxicosis may be regarded as ideal, one must agree with Lidz and Whitehorn that the brunt of helping the patient to regain emotional equilibrium must in general fall on the internist. Apart from the fact that the services of an expert psychiatrist are not always available, there is usually little difficulty in obtaining information from the patient about the disturbing factors in the life situation, for, as these writers point out, the thyrotoxic subject is generally an "outgoing" person who relates to others easily. Moreover, they consider there may be danger in energetic psychiatric approach, and recommend

an active "superficial" psychotherapy, amounting essentially to prompt decision and advice on practical details.

It is not possible here to give details of all cases in this series, but below are a few typical histories.

Illustrative Cases

Case 1: Rapid Response to Treatment.—A man aged 27, when first seen, was a classical example of thyrotoxicosis, with a large vascular goitre, exophthalmos, and all the typical symptoms. A remarkable psychiatric history was obtained from him. He had been an unstable child, timid and afraid of the dark, because of association with an apprehensive nervous mother and quarrels and drunkenness in his home. At 16 he had a "nervous breakdown" associated with worry and feelings of guilt over masturbation. He was an unsteady worker because, as he thought, conditions always affected his health. Just before joining the Army he had a "nervous breakdown," on account of which he left work. During this time he was "accidentally" called up for the Army. He was sent overseas and seems to have been intensely phobic about his health from the beginning. In India he developed nervous diarrhoea. He became panic-stricken when he got malaria, believing that because of his masturbation he would not be able to withstand it, and from then onwards his diarrhoea continued. He was invalided home with a diagnosis of sprue, although it seems probable that the disorder was of nervous origin. On returning to the United Kingdom he had an acute psychotic breakdown and was admitted to a military mental hospital, being eventually discharged from the Service. Owing to gross instability he lost one job after another. Then he developed syphilis—quite credibly, as he claimed, at the first possible exposure to infection. Although he sought immediate treatment this infection appears to have caused intense nervous upset and phobias of ill-health. Soon afterwards he developed the thyrotoxic symptoms. Although it was thought at the onset that the emotional disturbance was the essential disorder, his thyrotoxic state was so pronounced that it was considered necessary to bring this under control with thiouracil before any psychiatric approach was made. He responded remarkably rapidly to this treatment and soon began to receive simple psychiatric guidance. In a short time he declared he felt better than he ever had, and ascribed this to the reassurance he had got regarding masturbation. Thiouracil was stopped after 10 weeks and he has been under observation now for 16 months. During this time there has been no evidence of recurrence of thyrotoxicosis.

Case 2: Rapid Response to Treatment.—A fireman in the River Fire Service, aged 36, had been at work on a fire aboard ship and was trapped in the burning hold. He thought at the time that there was no way of escape, but eventually got out safely. When first seen nine months later he had lost 22 lb. (10 kg.) in weight and showed all the signs of thyrotoxicosis. He made a dramatically rapid recovery after only eight weeks' treatment with thiouracil. He has been kept under observation for three years and has remained perfectly well. This man, who made an unusually rapid response, seemed, unlike the usual thyrotoxic patient, not to have been nervous previously. Moreover, this form of psychological trauma as a precipitating factor is unusual.

Case 3: Requiring Maintenance Dose.—A woman aged 30, when first seen, showed all the classical features of thyrotoxicosis with considerable goitre which had developed within the previous 18 months. Nervousness had been her complaint for 2½ years, but she denied knowledge of any precipitating cause. She was the daughter of a West Highland crofter and admitted to excessive shyness in childhood. She has always been a nail-biter. At 19 she became a mental nurse and subsequently married an attendant in a mental hospital. She came to Glasgow, where she encountered serious housing difficulties. Shortly before the onset of symptoms her father, to whom she appears to have been over-attached, died. She had one child, and was always apprehensive about her health. Soon after her father's death she gave birth to her second child. At the time of onset of thyrotoxic symptoms, therefore, she had anxiety regarding housing and additional family responsibility, and great emotional disturbance from bereavement. This case illustrates the rather frequent association of bereavement with the onset of symptoms. Moreover, while the history of emotional upset before the onset of symptoms is highly suggestive, it is to be noted that the patient herself was unaware of a precipitating cause of nervousness.

Case 4: Requiring Maintenance Dose.—A man aged 58 presented marked symptoms of thyrotoxicosis with considerable exophthalmos. He appeared to have had a lifelong mild chronic anxiety state, dating from childhood, with fear in the dark, and a psychiatric illness of some severity during the first world war. Ever since that time his consumption of alcohol can only be described as profound, the anxiety state possibly being to some extent causative. In recent years he has worked during the night as a baker, and by day occupied himself as a police-watcher for a street bookmaker. This caused such nervous tension that he found himself incapable of carrying on if he was not "properly drunk." Latterly he became obsessed by the thought of police, seeing them in his sleep and panicking at the least sound. Mere mention of the word "police" caused noticeable increase of upper-lid retraction. He responded satisfactorily to thiouracil, and fibrillation settled eventually after quinidine. He has been under observation now for four years, during which time it has been found impossible to discontinue the thiouracil.

Case 5: Requiring Maintenance Dose, then suddenly able to abandon it.—A woman aged 25 gave a history that she had always been nervous. About two years before the date on which she was first seen she was working as a typist with an employer who was very exacting and sarcastic, and she attributed her greatly increased nervousness to this. At about the same time she got engaged to be married to a man who lived in London. She was markedly thyrotoxic, but made a very satisfactory response to thiouracil treatment. However, she remained nervous. She was obviously of a type that was easily upset, and described how she got very readily "into a flat spin" at her work. It transpired that she could not get a house in London, and under no circumstances would she go and live with her prospective mother-in-law. It was impossible for her to see her fiancé, because of distance and their different times of holiday. She continued in this state, although reasonably controlled with thiouracil, but there seemed no prospect of being able to abandon the drug until some eight months later when she broke the "engagement." Her condition improved immediately, and she was able to give up thiouracil. She has remained well without it for the past twelve months.

Case 6: Relapse.—A woman aged 25 with pronounced thyrotoxicosis gave a history of having been nervous all her life. She lived under poor social conditions in her parents' home, together with her husband and her five children. She was obviously terrified of another pregnancy. Later it transpired that at the age of 18 she had been raped one day returning from work. When she eventually told of this she said that she had forgotten about it, though she was then able to give the most detailed description of the incident. It is possible that she did in fact have amnesia of the event until it was brought to light in the course of psychiatric interview. She made a satisfactory response to thiouracil treatment and appeared to be very well until about six months later, when she again became pregnant. Although she was still on a maintenance dose of 50 mg. of methyl-thiouracil daily, her condition relapsed seriously. The pregnancy was terminated and sterilization performed. From that time onwards she has been well without thiouracil, maintaining her weight and a normal pulse rate. The goitre, however, was still considerable, and as she was worried about the appearance of this she eventually underwent thyroidectomy.

Case 7: Post-thyroidectomy Relapse.—A woman aged 53 underwent thyroidectomy first in 1941 and again 18 months later. Evidence of thyrotoxicosis soon became manifest again. Thiouracil was started in December, 1944. She has never been able to do without it since. On two occasions it was abandoned for periods of two months but had to be started again.

She has always been an emotional, insecure woman. For years she had anxiety about the health of her husband, who suffered from chronic heart disease and mental disorder until his death in August, 1947. She continues to be over-anxious and is easily upset emotionally. She suffers from paroxysmal auricular fibrillation and often complains of varying symptoms of a functional character.

Discussion

The above case histories are typical of the whole series and illustrate the important psychological features present in every patient. It would appear that emotional difficulties not only play an all-important part in precipitating a thyrotoxic state but also account for the differences in response to treatment and the tendency to relapse in certain cases. Accordingly it seems essential that in the treatment of thyrotoxicosis attention must be focused on the psychiatric aspects. In most cases the acute symptoms have to be controlled with thiouracil before the patient becomes responsive to simple psychotherapy, but the latter may, as in Case 1, prove the most important part of treatment. Admittedly the emotional problem may be difficult to solve and the thyrotoxic symptoms be kept in control only by continued therapy. Nevertheless, the discovery of the psychological disturbance may explain why a patient is unable to abandon thiouracil without relapsing and make it possible to give at least some advice and guidance, which often proves beneficial. It seems particularly desirable that examination of the psychological aspects should be attempted before any decision is made on thyroidectomy, as it might be possible in some cases to improve the patient without operation, while it might cause rejection as unsuitable of those cases which subsequently relapse and which then prove so difficult to control with thiouracil.

In conclusion, reference must be made to the second group in this series. These patients were nervous and had thyroid enlargement, but they were not thyrotoxic, at any rate at the time when examined. Yet four of the 93 patients had had thyroidectomy and a considerable number had in the past been treated with thiouracil without benefit. It is to be noted that, as shown in Fig. 1, these patients belonged to the younger age groups and that they gave a family history of thyrotoxicosis almost as high as that of the thyrotoxic group—11.8% compared with 15.3%. It seems an irresistible conclusion that these nervous goitrous patients are potential sufferers from thyrotoxicosis within the next 10 to 20 years. In view of what has been said above, it would appear desirable that such patients should have early psychiatric treatment in the hope that thereby this serious complication may be averted.

Summary

Examination was made of 265 patients suspected to be suffering from thyrotoxicosis. In only 144 cases was this diagnosis accepted.

Over 60% of thyrotoxic patients gained, and possibly at least 75% will ultimately gain, remission of symptoms after treatment with methyl-thiouracil. Patients who had previously undergone thyroidectomy often required a maintenance dose for an indefinite period and proved particularly liable to relapse if the drug was discontinued.

Inquiry into the psychiatric history revealed in every case disturbances which seemed of great importance in precipitating thyrotoxicosis, in accounting for relapse after either thiouracil therapy or thyroidectomy, and in explaining the necessity for continuing a maintenance dose. An attempt to deal with the emotional factor is regarded as an essential part of the treatment of thyrotoxicosis.

Attention is drawn to a group of patients complaining of nervousness and showing some thyroid enlargement but who were not regarded as thyrotoxic. It is suggested that such patients may be prone to develop toxic goitre in the future and that psychiatric treatment might be of prophylactic value.

Grateful acknowledgment is made to Dr. Adam Milne, now physician-superintendent, King's Seat Mental Hospital, Aberdeen, for his assistance in this investigation.

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BODY WEIGHT IN GRAVES'S DISEASE

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Loss of weight is one of the classical features of Graves's disease. It is recognized, however, that sometimes the loss may be insignificant, and occasionally weight may even rise while the disease is still active. Thus Joll (1939) said that "rarely the patient for a time actually gains weight, even very considerably." Linnell, Keynes, and Piercy (1946) pointed out the error of regarding loss of weight as a constant feature of thyrotoxicosis and observed that "maintenance, or even an increase, of weight is not very uncommon even in patients with primary toxic goitre."

Means (1948) noted that the nutritional state in Graves's disease varies greatly but in the average case weight loss is not evident. He added that occasionally a patient actually gains weight while thyrotoxic. A "plump" type of the disease was described by Trotter and Eden (1941). They studied eight patients who were plump in appearance and had gained weight before or after admission to hospital. Apart from the increase in weight these cases had several other features in common, and it was considered that they constituted a special type of Graves's disease. Moreover, differentiation of this type was found to be of practical importance because operative treatment gave unsatisfactory results.

The object of the present investigation was to study the nutritional state in Graves's disease, and the findings are based on 50 cases observed and treated during the past three years. Patients with hyperfunctioning adenoma of the thyroid (Plummer's disease) are not included.

Material and Methods

The series consisted of 47 women and 3 men; their ages varied from 22 to 54 years. Patients were accepted for the investigation only if the diagnosis was undoubted and complications, such as diabetes, were absent; otherwise

they were unselected. The following information was obtained about each case.

Basal Metabolic Rate (B.M.R.).—A considerable number of estimations were made at short intervals until a constant result was obtained. This "level" was usually reached in 10–14 days.

Initial Weight.—This was expressed as a percentage of the expected weight, obtained from age, height, and sex tables, and compared with the patient's own estimate of weight alteration since the onset of symptoms.

Calorie Value of the Diet.—A full dietary history was taken and the daily calorie intake calculated for the period immediately before admission to hospital.

Energy Requirement.—The method described by Wright (1945) was used, allowance being made for the increased B.M.R. A typical day's activity was analysed, with emphasis on the nature of the occupation, the amount of exercise, and the use of leisure. The daily calorie requirement was assessed on the basis of three eight-hour periods of sleep, work, and leisure.

The difference between the theoretical energy requirement and the calculated calorie intake was noted.

Results

The incidence and range of the initial weights is shown in Fig. 1. Seven patients were definitely heavier and 33 lighter than their expected weight; 10 approximated very

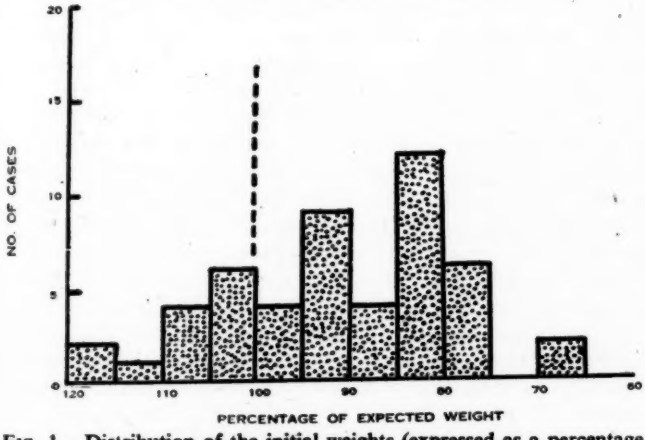

FIG. 1.—Distribution of the initial weights (expressed as a percentage of expected weight) of 50 cases of active Graves's disease.

closely to it. There was a fairly close correspondence in individual cases between the subjective estimate of weight alteration and the measured variation from the expected weight. Thus two patients who could be described as "plump" complained of getting too fat, 12 noticed no change, and 30 had experienced loss of weight of varying degree. Despite a few marked discrepancies—for example, one patient who said that her weight had been steady was only 80% of her expected weight—it was considered that, overall, the calculated percentage of expected weight was a good guide to the actual weight changes (Table I).

The level of the B.M.R. bore no relation to the degree of alteration in weight. The B.M.R. was between +25% and +30% in nine patients whose weights varied from 109% to 67% of their expected weight. One patient who was acutely ill with all the classical clinical signs of Graves's disease, including marked loss of weight, had a B.M.R. of only +9%.

TABLE I.—*Comparison of Subjective Weight Change and Percentage of Expected Weight*

Subjective Weight Change	No. of Cases	Average Percentage of Expected Weight
Loss greater than 1 st. (6·3 kg.)	12	83
Loss up to 1 st.	18	88
Nil	12	95
Increase up to 1 st.	6	108
Increase greater than 1 st.	2	118

Age may be of some significance in determining the body's reaction to thyrotoxicosis. With one exception all patients who were heavier than expected were under the age of 30; on the other hand, all over 45 were considerably underweight.

In most cases the balance of daily calorie requirement over intake fell within the range +1,000 to −500 calories. No significance was attached to this degree of difference because of the obvious sources of error in assessing the two figures; when the same methods of calculation were applied to 10 normal adult subjects the range was +700 to −600 calories. The results were striking, however, in the cases at the extremes of the weight range (Table II). The two

TABLE II.—*The Difference Between the Daily Calorie Requirements and Intakes Compared with the Initial Weights (Expressed as a Percentage of Expected Weight)*

	Balance of Daily Energy Requirements over Dietary Intake (Calories)	No. of Cases	Percentage of Expected Weight	
			Range	Average
Positive	2,500–2,000	2	69–67	68
	2,000–1,500	3	76–75	76
	1,500–1,000	2	102–96	99
	1,000–500	13	107–79	90
	500–0	12	113–81	93
Negative	0–500	14	108–78	92
	500–1,000	1	—	90
	1,000–1,500	1	—	99
	1,500–2,000	2	120–117	118

plump patients (120% and 117% of expected weight) were ingesting 1,850 and 1,600 calories respectively more than they theoretically required. At the other end of the scale all five patients who were 76% or less of their expected weight had a balance of requirement over intake of more than 1,500 calories.

Appetite was stated to be ravenous in 3 cases, increased in 35, unchanged in 11, and poor in one. The estimated value of the diets varied from 4,250 to 1,600 calories a day. The patient who was only 67% of her expected weight admitted having lost about 3 stone (19 kg.) and was taking the lowest diet of all. The figures for the two plump patients were the highest obtained—4,250 and 4,010 calories.

The Plump Cases

Some clinical details are shown in Table III. In Case 15 the adiposity was most marked on the upper back, anterior abdominal wall, and thighs—there were fresh striae in the latter site. This selective distribution was not obvious in the other patient, who just appeared to be moderately overweight. Biopsy of the abdominal wall showed in both instances normal adipose tissue and there was no clinical evidence of excessive fluid retention. The patients were

TABLE III.—*Clinical Features of the "Plump" Cases*

	Case 15	Case 23
Sex	Female	Female
Age	23	25
Duration of symptoms	4 months	6 months
B.M.R.	+25%	+30%
Percentage of expected weight	120	117
Complaint	Nervousness; goitre; "getting too fat"	Dyspnoea; prominent eyes; goitre; "getting too fat"
Menstrual periods	Regular	Regular
Enlarged tonsils	Absent	Absent
Appetite	Ravenous	Ravenous

considerably incapacitated by symptoms of severe thyrotoxicosis, and emotional instability was very pronounced. There was no menstrual upset.

The family history of Case 15 was of considerable interest. Her elder sister, now aged 36, was treated for Graves's disease by *x* rays in the Western Infirmary, Glasgow, in 1933. When interviewed, the sister said that during her illness she had a voracious appetite and became "puffy all over." The hospital record states that she was slightly obese and her weight was 139 lb. (63 kg.). At present she is very well and weighs 113 lb. (51.3 kg.). Compared with her younger sister she thought that her own obesity developed more slowly and was more generalized. There was nothing of significance in the family history of Case 23.

Methyl thiouracil alone was used in treatment, and satisfactory remissions were obtained. The drug was administered, in gradually decreasing dosage, for 18 months in Case 15 and for 15 months in Case 23; during the period of therapy they lost 16 lb. (7.3 kg.) and 12 lb. (5.4 kg.) respectively. The slow reduction in weight was a very striking feature and compares closely with the post-operative finding of Trotter and Eden (1941). The fall in weight was accompanied by a gradual diminution of appetite, and the calorie values of the diets, originally 4,250 and 4,010 calories a day, were 2,350 and 2,200 calories respectively one year after the beginning of treatment. The classical thyrotoxic symptoms such as nervousness, dyspnoea, and tachycardia subsided within a few months. The follow-up has as yet been short; but neither patient has relapsed, and their weights have remained steady.

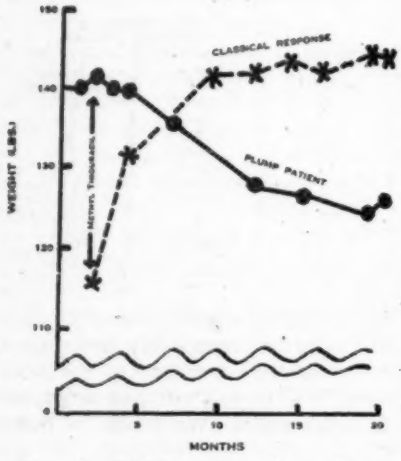

FIG. 2.—Weight curve of a plump patient compared with the classical response to thiouracil therapy.

Fig. 2 shows the striking difference between the weight curves of Case 15 and a patient who was considerably underweight before the start of treatment.

Discussion

Those who are most familiar with toxic goitre in all its manifestations agree that there is no sign of classical Graves's disease which may not be absent. There are many atypical categories, and diagnosis depends on a careful appraisement of the presenting clinical complex. A B.M.R. within the normal range or absence of eye signs does not necessarily exclude active thyrotoxicosis. The same holds for maintenance or even increase of body weight. Provided that natural remission is not taking place, gain of weight reflects an increase in the consumption of food sufficient to counterbalance the raised metabolism.

The plump patients differed from the classical ones in their excessively large appetite. No explanation can be offered for the cause of this bulimia, but its disappearance after treatment probably means that it was specifically due to the hyperthyroidism and not to any chance circumstance. Its occurrence in two sisters suggests the possibility of a familial influence. Whatever its pathogenesis, the large food intake acts in a protective manner and prevents the wasting which may be such a menacing feature of the disease. In the average case more food is eaten, probably in a vain attempt to counteract the nutritional effects of increased metabolism; occasionally the stimulation of appetite is so great that the attempt succeeds. As regards clinical severity, however, the well-nourished state of the plump patients was deceptive and their symptoms belied their appearance. They were no less seriously ill than more typical cases with an equivalent degree of thyrotoxicosis.

Trotter and Eden (1941) postulated that the plump type of Graves's disease was a specific entity; their patients were all young females who had pronounced signs but few symptoms; the incidence of lymphoid tissue overgrowth and amenorrhoea was higher than in ordinary cases and the results of operative treatment were unsatisfactory. The present investigation does not lend support to this theory. Apart from the gain in weight there were no gross differences between the plump patients and the classical ones. At one end of the scale were the fat patients, at the other the thin ones; between there was every nutritional grade. All were suffering from the same disease process—one which affects the balance of calorie intake and output; the latter usually exceeds the former, but the reverse may hold. The conception that weight is gained only in young women with a particular combination of physical signs seems hypothetical. The present study does support the contention that the set of circumstances causing increase in weight occurs exclusively in the young, but the series is small and only 11 patients were over the age of 40. It may be that the older patients have not the necessary resilience to protect themselves from the increased metabolism by excessive stimulation of appetite.

Thyroidectomy was performed on seven of the cases reported by Trotter and Eden (1941). Two died within a few hours and three had a recurrence. The authors considered that the operation was not only unsatisfactory but also dangerous, and suggested that medical treatment be preferred to surgical. This view was challenged by Linnell, Keynes, and Piercy (1946), whose experience of surgery in plump cases was no less satisfactory than in ordinary patients. If there remains any doubt about the wisdom of undertaking thyroidectomy, thiouracil treatment can be recommended.

Summary

The nutritional state has been studied in 50 cases of active Graves's disease. Their initial weights varied from well above to well below the expected weights. Two patients were plump in appearance.

The body weight depends on the balance between calorie intake and requirement. Appetite is specifically influenced by thyrotoxicosis and may overcompensate for the increased metabolic rate.

The fundamental disease process is the same in all patients whether they have lost or gained weight, and varies only in its relative effects on appetite and B.M.R.

The plump patients responded well to thiouracil therapy.

I wish to thank Professor J. W. McNee for criticism and advice in the preparation of this paper and Dr. A. A. Charteris for access to the records of his department.

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TREATMENT OF SIMPLE EPITHELIAL CYSTS WITH SECONDARY PHOTO-ELECTRON RADIATION

PRELIMINARY REPORT

BY

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This investigation was prompted by the relatively large number of children presenting at the Non-European Hospital, Johannesburg, for treatment of cystic swellings of the neck, generally of the "plunging ranula" type. For the purpose of this report a plunging ranula has been defined as any cystic swelling originating in the floor of the mouth and extending beyond the confines of the mouth.

Surgical removal has in our experience been unsatisfactory on account of technical difficulties encountered in the extensive dissection required and the frequent recurrence of the condition after removal. The injection of sclerosing agents has given uncertain results and produced occasional alarming reactions. Conventional roentgenotherapy with moderate dosage was found to be completely ineffective. For these reasons it was thought that an alternative form of therapy might be worth trying, and the gratifying results obtained with the safe and simple procedure adopted seem to justify publication at this stage.

Although the epithelial lining of these cysts is known to be resistant to ordinary doses of radiation, it was realized that it was possible to produce an intense local ionization in the cavity of the cyst with relatively small doses by exploiting the photo-electric activity of heavy metals exposed to Roentgen rays. It is a common experience in radiological practice that the presence in irradiated skin of heavy elements (ointments or lotions containing zinc, mercury, or iodine) causes a very great increase in the intensity of the skin reaction. It was therefore thought possible to destroy the secreting lining of a ranula by bringing into contact with it an aqueous suspension of a heavy element and exposing it to small doses of Roentgen rays.

The procedure provisionally adopted is to aspirate the contents of the ranula through a wide-bore needle under local analgesia and to introduce into the cavity 2 ml. of a 10% aqueous suspension of bismuth oxychloride ("bisoxyl"). This is followed by exposure to intermediate voltage Roentgen rays (140 to 180 kV) delivering about 300 r to the tissue at a single sitting. This quantity is entirely empirical; responses have been noted with smaller doses.

The photo-electric emission from irradiated matter varies in a complex manner with the atomic number of the elements concerned. It is estimated that, with use of the technique described, the composite value for the photo-electric absorption coefficient of the cyst fluid containing the suspended bismuth ($Z = 83$) would be not less than 40 times that of soft tissue (equivalent $Z = 7$); and the ionization in the immediate proximity of a bismuth particle might be many hundred times greater. The range of this secondary radiation, which consists entirely of relatively low-energy electrons, is only a few microns in tissue, so that no more than a single layer of cells could be affected, and no damage could be produced in the tissues underlying this single layer of epithelium.

Reactions to the procedure have been fairly uniform. Initially there is a brisk effusion which persists for the first week after the operation, so that, despite the previous aspiration, the cyst becomes somewhat larger and more tense than it was originally. Thereafter the mass shrinks steadily and within three weeks has become a small fibrous nodule. These reactions produce no discomfort, and treatment in hospital is unnecessary after the first week.

The four cases reported below have been selected from our earliest trials in order to illustrate the effect of the bismuth injection alone and the superiority of the combined injection–irradiation procedure.

Case 1

A coloured girl aged 10 was admitted on January 26, 1949, complaining of a gradually enlarging swelling in the right side of the neck of several years' duration. On examination a soft fluctuant mass was found extending from the floor of the mouth to the clavicle, and from the midline into the right posterior triangle of the neck in front of the sterno-mastoid muscle. It did not move on swallowing and was not attached to the skin.

On February 1, 60 ml. of a watery straw-coloured liquid was aspirated and 2 ml. of bisoxyl introduced. Next day the cyst had become larger and was much tenser; 300 r was administered to the mass laterally, and a further 300 r through the anterior aspect. On February 15 (13 days after irradiation) the lower half of the cyst had become obliterated while the upper half had not changed. A further 2 ml. of bisoxyl was injected into the remaining portion of the cyst, and 300 r delivered through anterior and lateral fields. On March 1 (27 days after the first treatment) a small firmly indurated lump was present in the right submental region.

Case 2

A Bantu boy about 13 years old was admitted on February 16 complaining of a slowly enlarging swelling under the chin of three months' duration. On examination a round fluctuant mass about 8 cm. in diameter was found occupying both digastric triangles of the neck. It was continuous with a small swelling in the floor of the mouth to the left of the fraenulum.

On February 24 the swelling was aspirated and 30 ml. of a yellowish gelatinous fluid was withdrawn. A further 10 ml. was aspirated on March 21 and 2 ml. of bisoxyl was introduced into the cyst. On March 24 the swelling had increased in size and was much tenser. The swelling in the floor of the mouth had also become larger. On April 23 (five weeks after aspiration) the characteristics had remained unchanged except that the cyst was a little firmer in consistency. *X*-ray therapy was administered, 300 r to the left and 300 r to the right side of the swelling. On May 5 (13 days after irradiation) the swelling in the floor of the mouth had disappeared, and that in the neck was hard and measured 3 by 2 cm. On May 17 (25 days after irradiation) the submental swelling was only 1 cm. in diameter, very firm, and loosely attached to the skin.

Case 3

A Bantu girl aged 15 was first seen in 1948, when she had a swelling in the right anterior triangle of the neck and another in the floor of the mouth to the right of the fraenulum continuous with it. She was admitted in March, 1949, complaining of steady enlargement of the lump. On examination there was a soft fluctuant swelling, occupying most of the right anterior triangle, measuring 10 by 7 cm. and extending from the midline to disappear postero-laterally behind the sternomastoid muscle. At this stage there was no swelling in the floor of the mouth.

On March 16, 50 ml. of a thick yellow mucoid fluid was aspirated, and 2 ml. of bisoxyl introduced. Two days later the mass had increased in size and had become firmer. On

April 5 (20 days after aspiration) the characteristics had remained unchanged, and 104 ml. of a pale yellow slightly mucoid fluid was aspirated and another 2 ml. of bisoxyl introduced. Next day a tense swelling larger than the original was again present. On April 27 the characteristics were unchanged, and 300 r was directed to the lesion. On May 10 (13 days after irradiation) a small, firm, indurated right submental nodule was palpable but not visible.

Case 4

A Zulu boy aged 15 first presented in March, 1948, with a swelling of the right side of the neck. Examination revealed two unrelated disorders—an extensive unilateral tuberculous adenitis with suppuration, and a distinct fluctuant swelling in the right submaxillary region communicating with a similar swelling in the floor of the mouth. Deep *x*-ray therapy, generated at 180 kV (cp) with 0.5 mm. Cu and 1 mm. Al

FIG. 1A.—Case 4 before treatment.

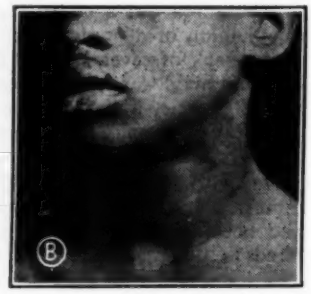

FIG. 1B.—Case 4 six weeks after the injection-irradiation procedure.

filtration, was directed to the cervical lymph nodes, which received 600 r in two weeks. It is estimated that the ranula received a similar dose. The glands responded partially to this treatment; the ranula remained unchanged.

On May 31, 1948, a block dissection of the cervical lymph nodes was performed, and histological examination of the specimen confirmed its tuberculous origin. Post-operative recovery was uncomplicated. On June 19 the adenitis was apparently cured; the ranula, however, persisted, and 10 ml. of glairy fluid was aspirated and 2 ml. of a sclerosing agent ("ethamolin") injected, with little effect.

The patient was readmitted on February 22, 1949, complaining that the swelling had persisted and was again enlarging. From February 23 to March 25 five injections, each consisting of 2 ml. of ethamolin, and three aspirations were done. There followed a pyogenic infection in the cyst, which was then incised and drained.

He was readmitted on October 7 with a complete recurrence (Fig. 1A). Fluid was aspirated on October 20 and 2 ml. of bisoxyl injected and 300 r given. On December 6 (six weeks after irradiation), apart from a hard nodule less than 1 cm. in diameter, there was no perceptible abnormality (Fig. 1B). He was well when seen on January 4, 1950.

Conclusions

It is obvious from a study of these four cases that the bismuth suspension alone did not obliterate the cysts; further, it is our experience that irradiation alone has no perceptible effect; yet the combined action of the two agents is completely curative. It is proposed to excise some of the residual nodules for histological study, though this is cosmetically unnecessary. At the time of writing, one year after starting the procedure, there have been no failures and no recurrences.

We wish to acknowledge the stimulating advice freely offered by Dr. P. Keen, of the Non-European Hospital, Johannesburg, under whose supervision this work was carried out.

Medical Memoranda

Plasmodium Vivax Infection

The following case report is of interest because it draws attention to an unusual symptom-complex of *Plasmodium vivax* infection—namely, severe urticaria, abdominal colic, and fever.

CASE REPORT

A Punjabi Hindu medical student aged 33 was admitted to hospital at 9 a.m. on August 2, 1949, with severe abdominal colicky pain which had started at 7.30 a.m. He developed an itchy rash all over his body within a quarter of an hour of admission, while the distressing colicky pain was continuing.

On examination his temperature was 102° F. (38.9° C.), pulse 100, and respirations 22. His blood pressure was 95/55. His abdomen was uniformly soft and localized tenderness could not be detected. The spleen and liver were not palpable. The rash consisted of weals irregular in shape and size, varying from small papules to moderately large plaques, with a pale centre and slightly reddish margins, and itching intensely.

On further inquiry the following facts came to light. At 9 a.m. on July 27 he first experienced an acute abdominal colic, situated around the umbilicus; the pain persisted for about two hours, with intermittent exacerbations, and then gradually subsided without any treatment. His bowels had been opened by a dose of liver salts. He remained well until July 31, when at about 8.30 a.m. he suddenly developed an itchy urticarial rash all over his body followed immediately by abdominal colic of similar nature. His temperature was 102° F., pulse 104, and respirations 22. Calcium gluconate, adrenaline hydrochloride, and "antistin" were given and the rash and colic disappeared in one hour, while his temperature had gradually subsided by 8 p.m. The defervescence was not associated with sweating. At 9.30 a.m. on August 1 severe and widespread urticaria developed, but there was no colic. He did not feel feverish and the temperature was not recorded. Next morning he was admitted to hospital.

The following therapeutic measures were adopted immediately after admission: absolute rest in bed; 25% glucose, 25 ml., and 10% calcium gluconate, 10 ml., intravenously; adrenaline hydrochloride (1 in 1,000), 0.5 ml. subcutaneously; normal saline enema, 1 pint (570 ml.); and an ice-bag over the abdomen. Colic was not relieved, but further spread of the urticaria was checked. Half an hour later 2 ml. of antistin was given intramuscularly and then continued twice a day. The rash faded completely within the next 20–30 minutes, and the abdominal colic subsided gradually. Antistin, 0.1 g., pulv. calc. lact., 10 gr. (0.65 g.), and mist. alkalin. diaphoret., 1 oz. (28 ml.), were given three times a day, and a sedative mixture with bromides and chloral was taken at bed-time. His diet consisted mainly of fluids—glucose water, barley water, green coconut water, milk, and tea. His temperature fell to normal by 7 p.m.

A blood count showed: Hb, 84% (Hellige); white cells, 7,000 (polymorphs 60%, lymphocytes 36%, monocytes 2%, eosinophils 2%). No malaria parasites were present in thick and thin smears. Examination of the stools (repeated three times) and urine revealed nothing abnormal.

Nothing untoward happened on August 3, but at 8 a.m. on the 4th the patient suddenly felt an attack of abdominal colic, which gradually grew worse and made him restless. His temperature was 103.4° F. (39.7° C.), pulse 102, and respirations 24. No urticarial rash could be detected anywhere on his body. He felt warm, but there was no chill or rigor. An ice-bag was placed over the abdomen and mist. carmin. bellad., 1 oz. (28 ml.), and antistin, 2 ml. intramuscularly, were given. The pain subsided gradually within half an hour. Thick and thin blood smears showed a fair number of B.T. malaria parasites, both ring and amoeboid forms (trophozoites). Proguanil was given immediately, two tablets three times on the first day, followed

by one tablet thrice daily for seven days. Urticaria, colic, and fever did not develop during his next three days in hospital or during the subsequent follow-up.

COMMENT

The symptom-complex characterized by fever, abdominal colic, and urticarial rash appeared about the same time of the day.

The absence of chill and rigor, nausea and vomiting, and profuse sweating during defervescence preclude a clinical diagnosis of malaria; but demonstration of malaria parasites in the peripheral blood film during the last attack and the complete disappearance of symptoms after proguanil therapy suggest the unitary nature of the symptom-complex. Further, it was noted that antistin did not prevent the return of abdominal colic and fever.

In the dietetic history nothing was suspected which could be incriminated for urticarial attacks; and examination of the stool revealed no pathological condition which could explain the abdominal colic.

Lastly, the association of malarial attacks with abdominal pain is a common manifestation of malignant tertian infection.

Our thanks are due to the superintendent, Dr. K. L. Sen, for permission to publish this report.

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Unusual Case of Subacute Intussusception with Spontaneous Elimination

Cases in which an intussusception has sloughed off and been passed per rectum are rare enough to be placed on record.

CASE REPORT

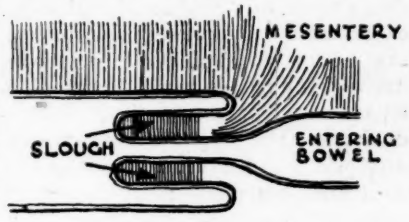
A child aged 2½ attended the casualty department on July 10, 1949, with vomiting and intermittent abdominal pain. She showed signs of a follicular tonsillitis and a urinary infection, but of no other abnormality. A course of sulphatriad (total 12 g.) cleared these with a temporary decrease of symptoms. However, the vomiting recurred and there was abdominal distension with some apparent constipation; she was therefore admitted for investigation.

On admission on July 20 she seemed to be in good general condition, with no wasting, but was extremely fretful. Her abdomen was grossly distended, tense, and tympanitic; no guarding was elicited and no masses were felt; a few borborygmi were heard. On rectal examination the anus appeared normal, the rectum felt empty, but some soft yellow faeces were seen on the examining finger. Other systems were normal. Her blood count was within normal limits, except for a leucocytosis of 15,000 per c.mm. with 80% polymorphs.

The child ate well and did not vomit. She had from one to four motions a day, which were normal or relaxed, contained no blood, and grew no pathogens. Her temperature was 100° F. (37.8° C.) on admission, and it never really settled till after operation. On the fourth day she passed what appeared to be a necrotic piece of tissue 15 in. (38 cm.) long, followed by a small pale stool. The child appeared relieved and was less miserable; the rectum felt empty and there was no blood on the examining finger. The following day the abdominal distension increased, and there was visible peristalsis, with a step-ladder pattern, an apparent increase in abdominal pain, but no guarding or rigidity and no palpable mass. A radiograph of the abdomen showed several fluid levels in the small intestine. A laparotomy was decided upon, and an intravenous plasma drip was started pre-operatively, as the child had started to vomit.

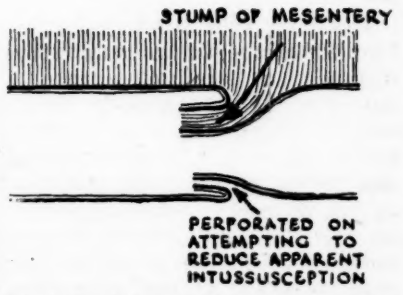
Operation.—The lower end of the ileum was found to be congested and adherent to other parts of the small intestine; the caecum and appendix were normal, but about 2 ft. (61 cm.) proximal to the ileo-caecal junction a mass resembling an intussusceptum was felt in the lumen of the intestine. On a very gentle attempt to reduce this, the wall of the gut opened and a little faecal matter leaked out; a finger-like projection was then visible inside the intestine. Adhesions were divided and a resection and end-to-end anastomosis were carried out. The wound was closed without drainage, and sulphonamide, penicillin, and streptomycin therapy was instituted; the plasma infusion was continued for 24 hours after operation. Faeces and flatus were passed within 24 hours of operation. Post-operative recovery was uneventful, except for a rectal prolapse on the third day, which was easily replaced.

Specimens.—(1) The slough was found to consist of necrotic tissue containing some moderately large arteries and a band of collagen fibres running longitudinally, suggesting that necrotic whole gut was present, rather than mucosa only. (2) The mass within the resected intestine consisted of fatty tissue containing some rather large blood vessels, and with a covering of mucous membrane.



COMMENT

It seems probable that there was a subacute intussusception in which a portion of the mesentery was drawn into the lumen of the intussuscipiens; that the intussusceptum sloughed off, leaving a projection of mesenteric fat pointing into the bowel; and that the neck of the intussusceptum and the base of the intussuscipiens were joined by adhesions to form a spontaneous anastomosis, which broke down at the lightest touch (see illustration).



Leichtenstern (1877) reported spontaneous elimination in 42% of 593 cases; but since then few cases have been reported. Three cases of gangrenous intussusception have been reported recently (Kerr, 1949; Conway and Dawson, 1949), in one of which end-to-end anastomosis was possible; in none of them did spontaneous elimination occur. The present case resembles these in that diagnosis was made difficult by an unusual clinical picture. Although there was a story of early vomiting, there was no wasting, such as is usually found in subacute intussusception, and no blood was at any time passed per rectum.

We thank Dr. Ursula Shelley and Mr. Harold Dodd for permission to publish this case and for helpful criticism; and Dr. J. G. Bate for the pathological reports and for help and advice in preparing this account.

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Conway, D. J., and Dawson, R. L. G. (1949). *British Medical Journal*, 2, 1153.
Kerr, J. A. (1949). Ibid., 2, 580.
Leichtenstern, O. (1877). In Ziemssen's *Cyclopaedia of Practice of Medicine*, 7, 477. London.

Reviews

THE SULPHONAMIDES

The Sulphonamides. By F. Hawking, M.D., and J. Stewart Lawrence, M.D., M.R.C.P. (Pp. 390; 46 illustrations, including 12 plates (7 coloured) and 17 tables. £2 2s.) London: H. K. Lewis and Co. 1950.

The authors point out in their preface that it is now 14 years since sulphonamides were introduced into medical practice. During the first 10 our knowledge of their application continually expanded; but this has now had a chance to become crystallized and consolidated, as latterly no outstanding new development of practical importance has occurred. In the last few years only, therefore, has a stage been reached when the subject can be reviewed with that degree of detachment which is essential if the views expressed are to have some permanency. The same is often said about biographies of great men who have played a determining part in world affairs—it is difficult to write with balance and judgment about them till they are very old or dead. The sulphonamides are of course not yet dead, and will still have an important role to play for years to come, but their glory is on the wane as their prerogatives are more and more encroached upon by the new antibiotics.

This book suffers only from the drawback inseparable from all therapeutic works nowadays, in that it has become slightly out of date as it has gone through the press—not in respect of the sulphonamides themselves but in connexion with the long-acting preparations of penicillin, of streptomycin, aureomycin, and chloramphenicol, whose introduction has still further modified the authors' recommendations as regards sulphonamide treatment. The review comprises an interesting, authoritative, and well-expressed account of the chemical nature, pharmacological action, preparations, clinical application, and toxic effects of the sulphonamides. It is written with critical wisdom and is profusely documented (there is a bibliography of 25 pages at the end of the book). The sulphonamides in their splendid old age could hardly have desired a more fitting memorial than this fine book.

D. M. DUNLOP.

A STUDY OF ANTIBIOTICS

Antibiotics. By Robertson Pratt, Ph.D., and Jean Dufrenoy, D.Sci.(Paris). (Pp. 255; 66 illustrations. £2.) Philadelphia and London: J. B. Lippincott Company.

The authors of this book, who are on the staff of the University of California College of Pharmacy, San Francisco, are best known for their studies of the mode of action of penicillin on bacteria. These were largely pursued by an ingenious technique consisting in the treatment of assay plates, after only a few hours' incubation, with solutions of various reagents, which revealed in colour the chemical changes occurring in the zone of inhibition, in that of normal growth, and in the interesting boundary zone between them.

The authors' interest in antibiotics is theoretical rather than clinical, and they bring to it a profound knowledge of chemistry and of plant physiology. They have thus been led to write a book different from any other on its subject, philosophical in outlook, and dealing rather with principles and mechanisms than with the practice of chemotherapy, although much of the information given is of great value in considering treatment. For example, the pharmacological and antibacterial behaviour of penicillin is well described in the usual way, but accounts are also given of the properties of different penicillins, of the influence of unknown enhancement factors and of borrelidin on therapeutic effect, and of the theory of optimum concentration. There is a chapter on industrial production, of which one of the authors has had practical experience, and all the newer clinically valuable antibiotics are well described. One would have liked to see all those derived from bacilli treated together: there is scarcely enough difference between bacitracin and the polymyxins to justify segregating them in separate chapters.

The book is profusely illustrated with charts, graphs, and other figures, many being original. Perhaps the most remarkable is that in which the growth curve of a green alga and the number of synthetic dyes patented yearly between 1850 and 1925 are plotted together to illustrate the argument in a section entitled "Significance of Fields of Diffusion." Altogether it is a most original and refreshing book.

L. P. GARROD.

THE HOUNAMAN MONKEY

The Anatomy of Semnopithecus Entellus. By A. Ananthanarayana Ayer, B.A., M.B., B.S., M.Sc. (Pp. 182; illustrated. 20 rupees.) Madras: The Indian Publishing House. 1949.

Monkeys were known in the days of prehistory and were depicted in early Egyptian times. Hanno, the Phoenician, on his famous journey from Morocco to Upper Guinea in 470 B.C. brought back an account, with three skins, of the greatest of great apes, the gorilla. It is possible that his gorillas were chimpanzees. Pliny records that these three skins still existed in the Temple of Astarte in Rome in the second century A.D. Linnaeus, in his *Systema Naturae* (1735), did not hesitate to place man along with the apes, lemurs, and bats in the order Primates. It is strange that our knowledge of the anatomy, physiology, development, and behaviour of man's immediate congeners has grown so slowly. Knowledge of great value to medicine and surgery might have been gained if more doctors in India and Australasia had devoted themselves to the study of their own local fauna, with the hordes of primates in the one continent and the mysterious medley of marsupials in the other. During the twentieth century there has been a costly and productive study of the anatomy, development, and behaviour of *Macacus rhesus* by Streeter, Hartman, Strauss, and Schultz in Baltimore and of the chimpanzee by Yerkes in Florida. There has been but little study of monkeys and apes in this country of recent years. This is strange, for with the exception of Brazil, the Dutch East Indies, French Equatorial Africa, and the Belgian Congo, most primates occupy the areas on the map of the world which are still coloured red, or a faint pink. F. Wood Jones stated that the dead hand of Charles Darwin and of Henry Huxley inhibited the study of primate anatomy which was so well started by Robert Owen and St. George Mivart.

This monograph on *Semnopithecus entellus,* the Indian langur or hounaman monkey so venerated by the Hindus, is a valuable contribution to primate anatomy. It was completed in 1942, but publication was delayed for six years. The anatomy of this Indian langur is described in detail, system by system, with careful dissections, accurate diagrams, and a wealth of astute observation. The anatomy of the visceral systems—respiratory, alimentary, and

urogenital—is very well done. The circulatory system, both arterial and venous, calls for still greater detail, as the pattern differs notably from that seen in man. The vessels of the thorax and abdomen are well worth further study at a time when thoracic and abdominal surgery are becoming more venturesome. In particular, the veins call for close examination, for they are of more significance clinically and a source of greater trouble surgically than the arteries. That despised minusculum, the pisiform bone, is described in detail, and the radiograph shows an epiphysis comparable to the epiphysis on the human os calcis. This proves that the pisiform is not a sesamoid bone. The peripheral nervous system is described in detail, with particular reference to the limb plexuses. The brain is shown to be the most advanced among the Cercopithecidae and has certain features which place it between the brains of *Macacus rhesus* and the gibbon. The fissures of the parietal lobe are certainly an advance on any other monkeys and confirm the early views of Elliot Smith.

It is a credit to the present Professor of Anatomy in Madras that he is following so well the path laid down by his predecessor, Professor U. V. Nayak, who died so young and yet contributed so much to our knowledge of the primates.

H. A. HARRIS.

HANDBOOK OF THERAPEUTICS

The Essentials of Materia Medica, Pharmacology and Therapeutics. By R. H. Micks, M.D., F.R.C.P.I. Fifth edition. (Pp. 438. £1 1s.) London: J. and A. Churchill. 1950.

This handy volume increases in usefulness with each successive edition and achieves this without any noticeable increase in size. It is written from the point of view of a practising physician rather than from that of the laboratory worker, but it is fair to say that the gap between these two has narrowed during the 15 years of the book's existence. The advances in specific, as opposed to symptomatic, treatment are responsible for this very desirable approximation.

The new edition contains an account of all the recently introduced substances, including the antibiotics, and it can claim to be free of any noteworthy omissions in a period when additions to the therapeutic armoury occur almost monthly. Tetraethylthiuramdisulphide is mentioned in the preface, but not in the index.

J. H. BURN.

The pioneers of medical ophthalmology in this country were physicians like Sir Clifford Allbutt and Sir William Gowers. Subsequently, it has been left to ophthalmologists to expound a subject which had become too big for either a physician or an oculist. Mr. Foster Moore's *Medical Ophthalmology* maintained the high tradition of Gowers's work, but like Gowers's book did not attempt to cover the whole field. This ambitious task has been undertaken in recent years by Dr. Tassman, of Philadelphia, and now by Mr. J. H. Doggart. Four introductory chapters in his *Ophthalmic Medicine* (London: J. and A. Churchill; 32s.) describe methods of examination, while the nine succeeding ones are on general concepts like allergy, the different infections, and inflammatory affections. The ocular aspect of the different systemic disorders such as skin diseases, endocrine affections, cardiovascular diseases, head injury, and bone diseases are discussed in other chapters, and there are sections about hereditary diseases, congenital abnormalities, the significance of refractive errors, and other disturbances with widespread manifestations. Though the scope of the book limits discussion in some cases to bare outlines, the text can be recommended as an introduction to a vast subject with a scattered and badly systematized literature. To the physician it should be useful as a guide to the ocular aspects of systemic diseases. The student of ophthalmology will find it a necessary reminder of the fact that the ophthalmologist is a physician as well as a surgeon.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Social Case-work in Great Britain. Edited by Cherry Morris. (Pp. 223. 12s. 6d.) London: Faber. 1950.

The Need for Emotional Adjustments in the Elderly. By L. Cosin, F.R.C.S. (Pp. 16. 1s.) London: The National Council of Social Service. 1950.

Teach Yourself Home Nursing. By M. Hutton, S.R.N., S.C.M., and S. K. Hutton, M.D. (Pp. 180. 4s. 6d.) London: The English Universities Press. 1950.

A Naturalist in the Gran Chaco. By Sir J. Graham Kerr, F.R.S. (Pp. 235. 21s.) Cambridge: University Press. 1950.

The XIVth International Veterinary Congress and the LXVIIth Annual Congress of the National Veterinary Medical Association of Great Britain and Ireland. Commemorative Pictorial Souvenir. (Pp. 24. 5s.) London: National Veterinary Medical Association of Great Britain and Ireland. 1949.

Science News, 16. Edited by J. L. Crammer. (Pp. 176. 1s. 6d.) Harmondsworth, Middlesex: Penguin Books. 1950.

Meaning and Purpose. By K. Walker. (Pp. 203. 1s. 6d.) Harmondsworth, Middlesex: Penguin Books. 1950.

A Doctor Digresses. By K. Walker. (Pp. 207. 10s. 6d.) London: Jonathan Cape. 1950.

Medical Jurisprudence and Toxicology. By J. Glaister, J.P., D.Sc., M.D., F.R.S.Ed. 9th ed. (Pp. 755. 35s.) Edinburgh: Livingstone. 1950.

A Handbook for the Diagnosis of Cancer of the Uterus by the Use of Vaginal Smears. By O. Gates, M.D., and S. Warren, M.D., D.Sc. 3rd ed. (Pp. 214. 32s. 6d.) Cambridge, Mass.: Harvard University Press. London: Geoffrey Cumberlege. 1950.

Transactions of the Association of Life Insurance Medical Directors of America. Fifty-eighth Annual Meeting. Edited by J. R. Gudger, M.D. Vol. 33. (Pp. 170. No price.) Newark, N.J.: Association of Life Insurance Medical Directors of America. 1950.

Le Problème du Cancer. By F. Daels. (Pp. 189. 7 Swiss francs.) Geneva: L'Effort Humain. 1950.

Les Maladies des Coronaires. By C. Laubry and P. Soulié. 2nd ed. (Pp. 618. 2,400 francs.) Paris: Masson. 1950.

L'Amibiase. By F. Blanc and F. Siguier. (Pp. 617. No price.) Paris: L'Expansion. 1950.

Spleniti e Spleno-epatiti. By G. Greco. (Pp. 118. No price.) Florence: Salpietra. 1949.

Chemotherapie der Tuberkulose mit den Thiosemikarbazonen. By G. Domagk. (Pp. 405. M. 60.) Stuttgart: Georg Thieme. 1950.

Praktische Elektrokardiographie. By F. Kienle. 3rd ed. (Pp 448. M. 38.) Stuttgart: Georg Thieme. 1950.

La Tríada Otoneurológica. By A. Ley. (Pp. 133. No price.) Barcelona: Ediciones Byp. 1950.

Kompendium der homöopathischen Therapie. By J. Mezger. (Pp. 151. M. 8.75.) Stuttgart: Hippokrates. 1950.

Homöotherapie. By the late K. Stauffer. 4th ed. Revised by F. Miller. (Pp. 679. M. 35.) Stuttgart: Hippokrates. 1950.

Collectanea Pharmaceutica Suecica. Vol. 4. (No price.) Stockholm: Ivar Haeggstroms Boktryckeri. 1950.

On the Classification of the Shigella Types. By S. Madsen. (Pp. 122. No price.) Copenhagen: Ejnar Munksgaard. 1949.

Physikalische Chemie in Medizin und Biologie. By W. Bladergroen, D.Phil. 2nd ed. (Pp. 675. 45 Swiss francs.) Basle: Wepf. 1949.

Coxitis tuberkulosa. By H. Gardemin. (Pp. 166. M. 18.) Berlin: Urban and Schwarzenberg. 1950.

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CRISIS IN TUBERCULOSIS

With other infectious diseases coming under control, there is no doubt whatever that tuberculosis is now our major public health problem. Yet we all seem supinely to accept a situation in which some 10,000 patients are kept waiting for nine months or longer for hospital or sanatorium beds while some 5,000 beds assigned to tuberculosis are empty for lack of staff. There seems to have been lacking any sense of urgency, and little of the vigour of action that has brought under control the infinitely less tragic infection, diphtheria. Yet in 1948 more than 19,000 patients died of pulmonary tuberculosis in England and Wales and more than 3,400 in Scotland; in the same year close on 44,000 cases of pulmonary tuberculosis were notified in England and Wales, and more than 8,000 in Scotland.

The fact that tuberculosis is a more serious problem in Scotland than elsewhere in Britain lends special weight to the excellent report from Scotland published in the opening pages of the *Journal* this week. Drawn up by a joint subcommittee of specialists and of experts in tuberculosis, it was intended originally to make recommendations for the development of an "optimum service." The recommendations made in the first part of the report provide a basis for discussion of ways and means for attaining this ideal. Much of this part of the report is wise and to the point; its proposals show the way for determining a long-term policy.

But the meat of the report is in the second part, fittingly entitled "Crisis Expansion." It is this which marks it out for distinction and should wake up all those who are responsible for the care of the tuberculous. The committee outlines the present picture boldly, and what it says of Scotland applies with equal force to England and Wales. It records its strong impression "that there is lacking any general appreciation of the urgency of the problem and of the need for a real emergency drive to deal with it. . . . A slow building-up of first-class sanatorium accommodation is not what is called for." The committee urges a crisis expansion on the lines of the Emergency Medical Service. It recognizes that the outstanding problem in the present circumstances is how to provide rapidly more functioning beds for tuberculosis and how to staff them. Two major factors have been responsible for the hold-up of the tuberculous: the first is that more cases are being diagnosed, and the second that advances in medicine have brought an increasing number of cases within the range of effective treatment. In a few areas, it is true, treatment at home is being carried out with relative success, and tribute is due to those who have undertaken the task. But most clinics are not adequately staffed or equipped to conduct domiciliary treatment, and, too, not many homes are suitable for the prolonged treatment of infectious persons. Domiciliary treatment is at best an expedient.

How to provide the beds and how to staff them is the fundamental question in this crisis. Discussion about division of responsibilities under the National Health Service, of divorce of treatment from preventive services, is interesting but irrelevant to the main issue. The shortage of beds has been neither caused nor aggravated by the National Health Service; its origins go much further back. In fact there should be within the framework of the N.H.S. far greater possibility of solving the problem than there was before, because the hospital management committees, and through them the regional hospital boards, have the responsibility for bed allocations throughout large areas. The authors of the Scottish report propose that the beds needed shall be acquired by taking over wards in hospitals for infectious diseases: only about a third of their accommodation is now occupied at any one time. They suggest tentatively that if it were found impracticable to provide in this way all the beds needed wards in general hospitals might be used, though the larger teaching hospitals should be excluded. There is much to be said for their first proposal, but only as a partial solution. The opening of units at present closed down in hospitals for infectious diseases will require much additional staff. Some of these hospitals would be ill equipped for any purpose other than the housing of untreatable tuberculous patients. The main problem is to find beds for patients urgently requiring special observation and subsequent treatment. If the view of the committee is accepted that "not until it [tuberculosis] is tackled in a spirit of crusade will the fight be won," then all the large general hospitals, without exception, should share the task of providing treatment for the tuberculous. It has been demonstrated, for instance, at the Central Middlesex Hospital that tuberculosis can be safely treated in special wards of a general hospital, and Dr. Joules has suggested[1] that general hospitals should help to meet the crisis by allocating to tuberculosis at least 10% of their beds. This would bring many advantages. The staff would be available; and nurses, doctors, and medical students would become acquainted with a disease which, though rife in the community, they have had little opportunity of studying in general hospitals.

[1] *N.A.P.T. Bulletin*, June, 1950.

The report makes many sound proposals for the recruitment of nurses, which is the crux of the matter of caring for the tuberculous. The committee stresses the need for the recruitment of trained nurses. Nursing the tuberculous can, if proper precautions are taken, be as safe as any other nursing. The shortage of tuberculosis nurses is a part of the shortage in all services outside the main teaching hospitals. It is only when nursing conditions are improved, both materially and socially, that recruitment campaigns will have any effect. The tradition of good nursing in this country could be maintained without the outmoded discipline of some of the training schools, and the fully trained nurse must be adequately paid. While there is a shortage nurses should be employed on nursing work and not on tasks well within the competence of untrained domestic staff.

The Tuberculosis Group Committee of the B.M.A. is investigating the tuberculosis services, and a standing advisory committee has reported to the Central Health Services Council. It is hoped that this report will soon be published. But what is needed now—desperately needed—is not reports but action. The well-written, cogent, constructive account of the Scottish Committee's findings and conclusions must be read and digested by those in authority. And if authority does nothing, then those with the welfare of the tuberculous at heart must harry authority ceaselessly until something is done. Here is a chance to test the much-vaunted adequacy of the National Health Service. The coherent Scottish mind has not hesitated to use the word "crisis." Let us as a profession hammer this word home, and insist that something is done as an emergency operation to relieve the burden of sickness which now afflicts the tens of thousands of tuberculous sufferers in Britain.

DEMAND FOR EARLY SETTLEMENT

The Health Service has now been working for two years. That it continues to run fairly smoothly is a tribute to all those who take part in it, and indeed to the general public. But there can now be no doubt that general practitioners are discontented and are labouring under a sense of injustice. And there is good reason for this. Recently the General Medical Services Committee sent to every general practitioner a document[1] setting out the history of its negotiations and discussions with the Ministry of Health. When the general practitioners entered the Service they did so on the understanding that their remuneration, the terms of which were provisional and never agreed, should be reviewed. Their remuneration remains to-day about what it was two years ago, a small exception being the increase in the mileage fund. During this time the Ministry has on one pretext or another postponed making any detailed factual reply to the doctors' claims. Last summer it carried out an inquiry, which took longer than was expected, into the actual earnings of general practitioners. So ineffectual was the method of inquiry that its results were worthless. This summer further inquiries are promised. If general practitioners are becoming impatient the Government has only itself to blame.

When the representatives of local medical committees met on June 29 at B.M.A. House the conference expressed itself as "seriously disturbed at the repeated hold-ups and prolonged delays in the negotiations," but agreed to co-operate in carrying out the new inquiries, emphasizing that these must be made soon and be accurate. Further, the G.M.S. Committee was instructed to make preparations forthwith for the ending of contracts by general practitioners in the Service. Advice will be given to end the contracts if there is no prospect of a satisfactory settlement. Another special conference will be called if that decision has to be made, and in any case one will be held in December if agreement has not been reached. Feeling was evidently running high at the conference and reflected the opinion, ascertained by local inquiries, of many general practitioners not present there.

While the negotiations on pay have been dragging on, the Minister and his officers have taken the opportunity to arouse anxiety on other but related issues. Doubt has been cast on whether the Government intends to implement the Spens recommendations, for the Minister will not state that the present central pool is in accord with them or that it is not. But since the Spens Report was agreed between the Government and the profession doctors have a right to know this, and they would resent any attempt, of which there have been hints, to repudiate the report without their consent and before any other basis for remuneration has been worked out. The conference therefore called on the Minister to state immediately what size the central pool should be to accord with the charter laid down by the Spens Committee.

In emphasizing that changes in remuneration should be made only after proper negotiation and not by the Minister's arbitrary action, the conference expressed the alarm that any doctor, or indeed any employee, must feel when he sees the precipitate speed with which the Minister, without waiting for a full inquiry, has at various times cut the remuneration of other workers in the Health Service, such as the dentists and ophthalmic medical practitioners. To be ever at the mercy of possibly despotic decisions arrived at without taking all the facts into account would cause anxiety intolerable to men who have no alternative way of earning a living but in their profession, and, for most of them, no other

[1] *British Medical Journal Supplement*, 1950, 1, 179.

way of practising their profession but in the Health Service. The great safeguard is the Spens Report. Without this, general practitioners might well fear arbitrary decision. It is now, after two years' working, essential to discover whether the Government considers practitioners are being paid according to the Spens recommendations. It is surely but common sense and common justice that all ambiguity should be removed. Thucydides remarked 2,000 years ago that men resent violence less than injustice, and if the Minister of Health does not deal fairly and squarely with general practitioners, and remove their feelings of injustice, then they may feel compelled to take the very grave step of ending their contracts.

THE ANNUAL MEETING

The 118th Annual Meeting of the B.M.A. begins next week on July 13 and comes to an end on July 21. Liverpool acted as host at the Annual Meeting in 1912 and this is the first time that two neighbouring towns have joined together to offer accommodation and hospitality for such an occasion: the Southport Division is acting as host to the Representative Body and providing facilities for the Annual Representative Meeting; when the debates on medical politics, organization, and administration have come to an end at Southport, Liverpool will take over for the remainder of the Meeting, which will be devoted to the scientific sections. As the published programmes in this *Journal* have shown, those responsible for planning the scientific programme have provided rich and varied fare, and it is good to see in the list of speakers a number of distinguished visitors from overseas. The motions and amendments from Divisions and Branches which will come before the A.R.M., the majority of which have been published in the *Supplement*, well reflect the nature of the problems now worrying the medical profession, especially those engaged in general practice. Hot upon the resolutions recently passed by the conference of Local Medical Committees come another batch couched in similar terms and to be debated by the A.R.M. These motions show that general practitioners are, to say the least of it, dissatisfied with their present terms of service. Their dissatisfaction resides in the fact that they cannot get a plain answer to a plain question, and the elusiveness of the Minister, for example, on the Spens recommendations is something that they find baffling and frustrating. Another matter on which there are many motions is the representation of general practitioners on regional hospital boards and on the medical advisory committees of hospital management committees. This again reflects the uneasiness felt at the tendency to exclude general practitioners from hospital life and experience. Under the heading of consultants and specialists come a number of motions expressing dissatisfaction with the work of grading committees and with the position of senior hospital medical officers. Other motions draw attention to the few specialist appointments awaiting a very large number of trainee specialists and to the fact that so many senior registrars are now unable to find work as consultants. Among many other motions we may note one which asks the Council to investigate the case for and against a whole-time salaried medical service, so that, if in the future such a service be proposed, the medical profession will be in full possession of the arguments for and against.

Those who are aware of the hard work put in during the past year by those responsible for organizing the Annual Meeting at Liverpool and Southport know that the Meeting will be a worthy successor to the other two that have been held since the war. These Annual Meetings do much to encourage and sustain the sense of corporate membership of the B.M.A., and afford a yearly opportunity for those who attend the Meetings to renew old friendships and make new ones and to exchange views on all those things that matter in our professional life, from the effect of the increased cost of petrol on practice expenses to the effect of cortisone on the human constitution.

THE PHYSIOLOGY OF LEARNING

The physiology of learning and retention was discussed by Professor J. Z. Young, of University College, London, in the Ferrier Lecture of the Royal Society, given last week. The problem which he posed was the identification of "the change that happens in the nervous system during learning": for evidently an animal which has learnt something has been changed, and "may remain so for the rest of its life." Professor Young followed a broad review, starting with the admitted inadequacy of Sherrington's classical reflex scheme in relation to higher activities, giving an account of some recent work by his own department on the learning process and associated neurology of the octopus. The learning experiments were carried out by B. B. Boycott and Professor Young at the Zoological Station, Naples. They were illustrated by a film and used the well-known technique of combining a simple food stimulus—in this case the sight of a moving crab—with a further stimulus—in this case the sight of a small white square from which an electric shock could be administered. In the intact octopus it was found that the response to "crab plus square" could be readily reversed as a result of three exposures per day repeated over three days. On the other hand, with either of two higher centres removed, but not with half removed as a control, normal "long-term" learning was prevented, so that interaction between these two centres appeared necessary for the learning process. However, if the interval between exposures was

sufficiently reduced, then an octopus which had thus been operated upon could still remember. To be precise, it could remember for five minutes but not for ten; which supported the view that "some stages of learning depend on the maintenance of an activity," and that when this activity has died down the results of "short-term" learning die with it. It would be difficult to imagine that the same process could account for the example of long-term and not consciously refreshed memory which human subjects can provide, or even for the permanent or near-permanent alterations in animal behaviour which can be experimentally effected; and Professor Young's main argument was that "more stable learning depends on the formation of specific pathways by some form of growth process." As a plan of organization common to both cephalopods and mammals he suggested a process of interaction between different higher centres, with the mutual relationships of fibres within their closely woven networks continually influenced by activity, "producing slight changes in form that alter the probable direction of the sequence of excitations." In other words, he considers that learning of the long-term kind is accompanied by morphological changes by which repetition of particular patterns of responses is facilitated so long as the associated changes themselves persist. He showed slides of histological preparations by Armstrong and Tittock, of his department, in support of the neurological plausibility of the suggested mechanism in the case of the octopus, and acknowledged also the assistance of D. Sholl and Dr. J. T. Aitken in regard to other material used in his lecture.

CENTRAL ACTION OF TUBOCURARINE

The property of paralysing the endings of motor nerves in skeletal muscle for which D-tubocurarine is so widely used to-day was demonstrated by Claude Bernard[1] in 1857, and earlier observations that it had a central action as well received less attention. Many workers since Claude Bernard, however, have obtained evidence of this central action, which is excitatory and not paralysing. Recently Euler and Wahlund[2] showed that the intrathecal injection of D-tubocurarine caused generalized convulsions in cats, and Eccles[3] found that it stimulated the frog's spinal cord. He investigated the action on the cord because extracts of curare cause paralysis not only at the neuromuscular junction but in sympathetic ganglia as well. He was therefore surprised to find the reverse effect on the cord. Soaking the cord in a curare solution increased the duration of the discharge of impulses set up by a single dorsal root volley. When the cord was soaked in strong solutions sustained activity was set up without stimulation. Salama and Wright[4] have injected tubocurarine into the ventricles of the cat's brain and have found that both by this route and also by the cisterna the injection causes an increase in the knee jerk and in the flexor reflex, an increase in the rate and depth of respiration, and a rise in blood pressure. General convulsions result. Intrathecal injections differ, however, because the effects are slow to appear, and if the subarachnoid space is blocked above the injection they are very small or absent. Thus in the cat the supraspinal centres are much more sensitive to the stimulant action of tubocurarine than is the spinal cord.

This new information about the central stimulant action of tubocurarine modifies the theory of its peripheral action. It is known that neostigmine augments the muscle strength of patients with myasthenia but weakens that of normal persons when given intra-arterially; thus neostigmine can have both a stimulant action and a paralysing action at the motor end-plate. Tubocurarine causes paralysis only at the motor end-plate but has a stimulant action on the centres of the medulla and above. Some will consider that these two actions of tubocurarine are unrelated. Others will see in them evidence that the process of transmission by acetylcholine at the motor end-plate is closely related to transmission from one neurone to another in the brain. Fortunately the central stimulant action is of no importance in the practical application of tubocurarine.

[1] *Leçons sur les effets des substances toxiques et médicamenteuses*, 1857, Paris.
[2] *Acta physiol. scand.*, 1941, **2**, 327.
[3] *J. Neurophysiol.*, 1946, **9**, 87.
[4] *Brit. J. Pharmacol.*, 1950, **5**, 49

STILLBIRTHS

The medico-social problem of stillbirths has often been discussed since the publication of the stillbirth rate in 1929 by the Registrar-General. The rate varies consistently in different areas of the country, and the association with economic-environmental indices has led to stress being placed on the importance of social conditions. The results obtained in several investigations suggest that there has been some confusion between correlation and causation, and on the evidence now available the social factor appears to be an inadequate explanation for variations in the rate. In a recent review of this complex subject Sutherland[1] has carefully considered the epidemiology and social significance of stillbirths. There are about 21,000 of these each year in England and Wales, and if the stillbirth rate throughout the country could be reduced to the level of the rate in London there would be nearly 3,000 fewer stillbirths a year.

Medical, social, environmental, and biological factors affect the chance of surviving the process of birth, and it is often impossible to determine the exact cause of a stillbirth. Their classification under various causes has differed greatly in different investigations: the proportion of stillbirths for which no definite cause could be assigned has ranged from 1/5 to 1/3, while complications of labour have been held responsible for between 1/4 to 1/3, and toxaemia for about 1/10, of all stillbirths. A common finding has been that in a large proportion of stillbirths some foetal defect was present or the birth was premature. Much has been written about the effect on the baby of haemolytic disease and of the results of an attack of German measles early in the mother's pregnancy, but these disorders are not necessarily associated with stillbirths and collectively they can have very little influence upon the stillbirth rate. The relation

[1] *Stillbirths*, 1949, London.
[2] *Hlth Bull.* (Dept. of Health for Scotland), **8**, 17.
[3] *Physiol. Rev.*, 1921, **21**, 438.

between social and economic conditions and the chance of a stillbirth has been demonstrated by many workers: for the country as a whole the rate increases from social class I to social class V. In America the rate has been shown to decrease as the father's income rises. Overcrowding increases the risk of infection; this is serious for live infants, but is not likely to affect the stillbirth rate. While the nutrition of the mother is obviously important, malnutrition probably does not have such a great influence on the stillbirth rate as was once believed. The system of rationing and the priorities given to expectant mothers during the war reduced or cancelled altogether the differences between the diets of the various social classes. Despite this levelling of nutrition the stillbirth rate of the higher social classes fell much more than that of the lower social classes. McKinlay[2] found for Scotland that the fall in the stillbirth rate per 1,000 births between 1939 and 1945 was from 33.9 to 20.9 for class I, from 37.8 to 26.0 for class II, from 38.0 to 37.1 for class IV, and from 42.4 to 39.1 for class V. The experience in the occupied countries during the war supported Huggett's contention that the foetus grows at the expense of the mother.[3]

The proportion of first-born among the births affects the stillbirth rate, since these infants are more likely to be born dead than the second or third child, but for fourth and later children the stillbirth rate rises again. It also rises as the intervals between pregnancies shorten and as the mother's age increases. Whether the age of the father has any influence is debatable, but from the results obtained in animal experiments it is unlikely that the age of the father is of any importance. Two causes of stillbirth are often ignored because their influence on the rate is difficult to assess. Attempts by expectant mothers to produce abortion probably have some effect, but more important is the genetic factor. The origin of some congenital malformations, which are a common cause of stillbirths, is undoubtedly genetic, though in many cases both hereditary constitution and maternal environment and other non-genetic factors probably act together. The relationship is, however, a complex one, and its unravelling presents one of the most difficult problems in human genetics. The end-point of many conditions fatal to the foetus is not reached at the same time, and the result may be either abortion, stillbirth, or early neonatal death. The problem of stillbirths is part of a larger one which includes prenatal and early post-natal deaths, and any scheme which aims at lowering the stillbirth rate must, to be successful, be of a comprehensive character.

CHILDREN AND THE CINEMA

One-half of all the children of school age in Great Britain go to the cinema once a week, and nearly a quarter of them go twice a week or more often. Many more children go to the cinema than go to church and Sunday school. It may be said, therefore, that, after home and school, the cinema is the most important influence in the life of the modern child. The report of the Departmental Committee on Children and the Cinema, of which Professor K. C. Wheare was chairman, has recently been published.[1] The committee inquired into the effects of cinema attendance upon children and was asked to make recommendations about the classification of films, the conduct of cinema clubs for children, and other related questions.

Films are classified at present into three categories: "U" for universal exhibition; "A" films, which children may see only if accompanied by an adult; and "H" for horrific films, which children are not permitted to see. The committee presents good reasons for regarding this classification as unsatisfactory. The "A" classification places upon parents or guardians the responsibility for deciding, usually without first-hand knowledge, whether a film is fit for their children to see. It has also had the unforeseen and unfortunate result that children now stand outside cinemas asking adults to take them inside to see "A" films. The following classification is suggested by the committee: "C" films, which are made solely for exhibition to children, and "X" films, which are entirely unsuitable for exhibition to children. It recommends the formation of a Central Committee on Children and the Cinema, and one of its main duties would be the selection and classifying of films for children.

There has been considerable argument about the effect of the cinema on the mind, the behaviour, and the morals of children. There is good evidence that many children are frightened, and that some are terrified, in the cinema, but the Committee does not find any proof that there is a direct relationship between the films and juvenile delinquency. The cinema may sometimes determine the path of the delinquent, but films seldom provide the initial impulses towards delinquency. The threat of the film to the young mind is more subtle. Too many films are stupid, sentimental, crude, or materialistic, and so unlikely to stimulate the quick intelligence, the lively humour, and the idealism of youth.

Children's cinema clubs have been a remarkable development of recent years, and the report gives to them a limited approval. To the disinterested observer they would seem to be an artificial by-product of the industry. The social and recreational activities of children should not have their normal centre in the field of commercial entertainment, and the average manager of a cinema is seldom likely to possess the qualities of an experienced youth leader. The most important problem is the inadequate number of films which are specially produced for exhibition to children. Most of these have been made by the J. Arthur Rank Organization, and it appears probable that financial difficulties may hinder this public-spirited activity in the future. The proposed Central Committee may require therefore the control of some public money, and it must also generate in the film industry something of the enlightened social conscience which animates the B.B.C. The function of the film is admittedly not education but entertainment. Yet a deliberate attempt by the cinema to increase the range of enjoyment and the artistic sensibility of the public at large, and particularly of children, would be a valuable social experiment.

The Gold Medal of the Royal Society of Medicine was awarded on July 4 to Professor E. D. Adrian, O.M., M.D., F.R.S.

[1] *Report of the Departmental Committee on Children and the Cinema.* London: H.M.S.O. Price 3s.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE MANAGEMENT OF PULMONARY TUBERCULOSIS

BY

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Until recently the part played by the general practitioner in the management of a patient suffering from pulmonary tuberculosis was confined largely to diagnosis at the earliest possible moment, the care of the patient when quiescence had been achieved, and the palliative and symptomatic treatment of patients with advanced disease who were beyond the scope of radical treatment. The radical treatment was carried out institutionally.

The present position, in which patients have to wait for six months and upwards before admission to sanatorium can be obtained, has altered his role completely. He must now be prepared to undertake treatment in the home.

Among the very few facts that have been established beyond question is that, all things being equal, the fate of the patient depends on the stage at which the diagnosis is made. Early diagnosis is arrived at as the result of (1) mass and routine radiographs of symptomless patients, and (2) alertness of the general practitioner to recognize the possibility that certain very mild toxic and lesional symptoms may indicate the presence of pulmonary tuberculosis. Only the second concerns us here. If the practitioner has already in his mind that pulmonary tuberculosis is a likely diagnosis in any patient who complains that he is slightly below par, or has a cough for a month without an obvious cause, the disease will be diagnosed much earlier.

A few fundamental points must be emphasized :

(*a*) That blood in the phlegm comes from the throat so rarely, except in the presence of a definite epistaxis, that this source should never be diagnosed.

(*b*) That it takes a large number of cigarettes smoked over a long period to produce a smoker's cough.

(*c*) Young adults do not get persistently tired without reason ; a method of life which has not previously produced tiredness is not likely to be the cause.

(*d*) The patient's explanation of a symptom should not be accepted without investigation if the symptom is sufficient to bring him to the doctor.

(*e*) " Catarrh " is often caused by intrathoracic conditions.

(*f*) Pleurodynia is not a diagnosis. If it is called a pain in the chest no one will be misled.

(*g*) However expert the doctor is in the use of the stethoscope he can never exclude tuberculosis with it.

When tuberculosis is suspected it should not take more than ten minutes to scribble a card to a clinic or a hospital asking for a radiograph, to give the patient a special carton for collection of sputum and instruction what to do with it, and to estimate the erythrocyte sedimentation rate. If these are all normal few cases of pulmonary tuberculosis will be missed. From the point of view of pure economics it is cheaper to take 2,000 negative radiographs than to delay diagnosis of one case of pulmonary tuberculosis for three months. In young adults, by the law of average, five cases with *x*-ray shadows indicating a tuberculous lesion which requires full investigation will be found in every 2,000 cases *x*-rayed at random.

Telling the Patient

The method by which the diagnosis is conveyed to the patient is most important. He must always be told what is the matter as soon as the diagnosis is certain. To many patients the diagnosis will come as a crushing blow ; to some it will seem almost a sentence of death ; so it is advisable to point out that with adequate treatment and co-operation with the doctor the prognosis is good, but no commitment should be made on time. The patient should be informed that to get well is a full-time job : the important thing is to get him well once and for all and to make a good job of the treatment at whatever expense in time. He should be encouraged to ask questions even if the answers to them cannot be given : it will help the doctor to see his reaction to diagnosis and to understand how to handle him. Fears brought out into the open are less frightening than those which are brooded over.

When pulmonary tuberculosis is diagnosed the patient should be put to bed immediately. Frequently, owing to his commitments, this may be impossible ; so if the symptoms of toxaemia are minimal he may be allowed a few days during which he can make some provisional arrangements, provided he rests as much as possible when doing so. The object of insisting on bed rest without delay is to prevent the disease from getting worse while a plan of campaign is being arranged. Few patients who have any real chance of getting well will deteriorate during a month's rest in bed. Even if you could get the patient into a hospital or sanatorium it is unlikely that any specific method of treatment would be embarked upon profitably before he had had a few weeks' rest in bed.

First Measures

Having got the patient in bed the following should be done :

1. The clinical state must be assessed.

2. His temperature should be taken for at least five minutes in the mouth, on waking and at 2 p.m., 6 p.m., and 10 p.m. for a week : after this it need be taken only first thing in the morning and at the other time at which it has been found to be highest.

3. The sedimentation rate should be estimated.

4. If the temperature is 100° F. (37.8° C.) or more the patient should be confined strictly to bed, use a commode, and be blanket-bathed. If it be less, or after it has remained at normal for a week, he may be allowed up once a day for toilet purposes and twice a week for a bath.

The doctor must then go into details about

1. The food—its quality and service.

2. Ventilation and heating of the room.—There is no need to freeze the patient, but the room must be well ventilated and the lighting of his room must be adequate.

3. Visitors.—The daily number and length of stay must be laid down. No more than one, and for half an hour at a time, is the golden rule, unless the patient is atoxic.

4. Rest hours.—The patient should lie flat in solitude without doing anything except listen to the wireless for an hour before and after lunch and before supper.

5. Occupation.—Until the temperature has settled completely for at least 14 days his occupation should be confined to reading, listening to the wireless, and writing occasional letters.

6. Sleep.—A mild hypnotic should be given without hesitation to produce sleep if there is insomnia.

7. Prevention of infection to others.—All handkerchiefs must be put into a bag and soaked in 1/20 lysol before being sent to the laundry; if there is sputum, a proper container must be used with 1/20 lysol at the bottom. When bed-making, the attendants should wear a mask. No children should be allowed in the room, and adolescents should sit near an open window.

8. Small amounts of alcohol may be allowed. Smoking should be cut down without undue delay to about five cigarettes a day.

9. All the instructions must be discussed with the patient and family, and put down in writing. If the doctor does this the patient will realize that they are important.

Main Plan of Treatment

The plan of treatment must then be worked out with the help of an expert—either the tuberculosis physician or a private consultant. Unless the patient is really ill, it will do him little harm to be taken in a car to the consultation, but his doctor should be present to discuss the plan. A place in an appropriate institution must be booked. It can easily be cancelled if not needed. Generally speaking, three months' bed rest will be the start. If cavities are present this will usually be followed by collapse therapy, for which institutional treatment is necessary. Provided that steady improvement in the reduction of toxaemia is taking place as shown by symptoms, fall in temperature, sedimentation rate, and reduction of sputum, rest may be carried on for three months.

At the end of that time the case should be reviewed, with fresh radiographs, sputum tests, etc., in consultation with the expert. There is no need to get the patient up before going to the consultation. There are three possibilities. First, all evidence of toxaemia, occult and manifest, may have disappeared and the radiograph may show much improvement; cavities if present may have closed and the sputum become negative. This indicates a short further period of bed rest to consolidate the improvement and a gradual increase in activity, preferably in an institution or sometimes, if the patient's temperament and home circumstances are satisfactory, at home. The older the patient the less well will he usually settle down in a sanatorium. Secondly, improvement in toxaemia has taken place but improvement radiographically is slow and/or cavities are present. Bed rest must not be relaxed and institutional treatment insisted on, though the latter is not urgent, as further improvement may be looked for. Thirdly, little improvement has taken place. In this event institutional treatment is urgent; for the patient will probably not improve without collapse therapy with or without streptomycin, etc.

Collapse Therapy

The only form of collapse therapy that is normally applicable at home is a pneumoperitoneum with a phrenic nerve interruption. If this is thought to be indicated the patient can be got into a hospital for a week to have the phrenic nerve crushed and the pneumoperitoneum started. A pneumoperitoneum can be kept up by a careful general practitioner who will take the trouble to learn the technique. The complications are very rare, and failure to sustain the optimum rise of the diaphragm is not very serious. Except in early and fortunate cases, this procedure will usually only prepare the patient for more drastic collapse therapy, but often a very marked improvement can be obtained. Artificial pneumothorax should never be handled except by an expert with an *x*-ray plant at his disposal: irreparable harm can be done by an incorrect choice of cases and errors in its conduct. Frequently the actual technique of refills is easy, but it requires long experience to be able to handle cases to the best advantage and to avert and deal with complications.

In recent years apical thoracoplasty has been used more often in cases with small cavitated lesions at the apex, and in skilled hands has a low mortality rate. It is no longer reserved for patients with extensive disease. Resection of part or the whole of a lung is being used on quite a large scale now that the theoretical objections have been found to be unfounded. It is attended, however, by much greater risks than thoracoplasty and should be attempted only by those with very wide experience.

Chemotherapy

Streptomycin is now settling down to its proper place in the treatment of pulmonary tuberculosis. Broadly speaking, its use lies in the treatment of recent infiltrative or pneumonic disease, tuberculous laryngitis, or tuberculous tracheobronchitis, which is a much commoner condition than was previously assumed. In cavitated disease its value lies in getting a patient fit for collapse therapy. A useful simile is that of a boxing match in which you are getting the worst of the contest. If a friend can hold one of your opponent's hands you will be given the opportunity to knock him out. If you fail to do so during the time that the hand is held you will be beaten when your opponent gets the use of his hand again if he is still on his feet. Streptomycin plays the part of the friend, and its favourable action is limited in time. After a varying period the tubercle bacillus becomes resistant to it and your chance has been lost. Accordingly its use should always be part of a well-considered plan of campaign. Complications are by no means negligible, especially in old patients.

P.A.S. (para-aminosalicylic acid) is given in doses of 10–20 g. daily for a month and is used for similar types of case. The effects are less dramatic and certain than with streptomycin, but the development of resistance against it is rare under ordinary circumstances. Unfortunately its use has to be discontinued in a large number of cases because of vomiting and diarrhoea. There are hopes that the use of both of these drugs together may get over many of their disadvantages.

In most cases institutional treatment is necessary sooner or later, but the patient will have to be reassured that in a well-run place superinfection is not a practical risk.

The Convalescent Patient

When the patient becomes convalescent the role of the general practitioner is very important. Even to the specialist it is often difficult to decide when the patient should be allowed to get up; the general practitioner should therefore keep on the safe side: it is much better for the patient to remain at rest for a month too long than to get him up

too soon. As a rule at least a normal temperature, a normal sedimentation rate, three negative sputa, and a radiograph showing no cavitation and only retrogressing shadows should be obtained before the patient is allowed up. When the patient is judged fit to get up the time out of bed and the amount of exercise are gradually increased, so that he is up for eight hours and walking a mile at the end of a month, and up all day except for two hours' rest and walking four to six miles a day at the end of three months.

When the patient returns from institutional treatment a full report from the hospital or sanatorium should be obtained and a full assessment of the case made, with the help of a new radiograph. Both for patients who have returned from sanatorium and those who have recovered at home a detailed programme should be drawn up with the assistance of the specialist who is going to help to look after the patient; gradual increase of activities should be permitted if the check-ups show healing of the disease. The temperature chart should be continued and monthly radiographs and sedimentation rate obtained until the patient is judged fit to return to work. Any deterioration of these should lead to careful review of the case and, if necessary, more drastic treatment. Return to work should, if possible, be gradual. Usually the patient should go back to his old job unless the hours are excessive, the work very strenuous, or the conditions unhealthy.

For the first six months a monthly check-up is essential and a comparative radiograph called for at least every two months. Relapse should be spotted as early as possible, but too much attention must not be paid to equivocal radiological changes; small differences in shadows are often due to differences of technique, but the appearance of a new shadow in a reasonably comparable film should be regarded as evidence of relapse. This often appears without any clinical change. Sputum, if present, should be examined regularly.

Any febrile catarrhal attack indicates the necessity for a new radiograph before return to work is allowed. When relapse has been diagnosed prompt treatment is indicated. A second period of bed rest seldom produces as good a result as the first, and collapse therapy is usually indicated. The intervals between the check-ups which have taken place every month for the first six months can be extended to two months, but this should be maintained for two years. After this, every three months will be sufficient for the next two years, but a radiograph should be taken every six months for an indefinite period if the disease has been extensive or slow to respond to treatment. If the patient remains well for two years the chances of healing improve steadily. It must be remembered that worry and strain and excessive activity at home are just as harmful as long hours at work, and are usually much easier to avoid.

Home Contacts

Examination of the home contacts following the diagnosis of pulmonary tuberculosis in a member of the household must not be neglected. All children under 10 should be tested for infection by a jelly test, or by the Mantoux test (up to 1/1,000 dilution) if over 10 years of age. A negative result, provided that six to eight weeks have elapsed since the last contact, indicates freedom from infection, and calls for no further action while contact is not taking place. All positive reactors and older contacts must be *x*-rayed. In contacts over 30 a single negative radiograph is sufficient unless contact is continued with an infectious case. Children who are positive reactors and adolescents should be *x*-rayed again after a further six months and annually for five years.

The use of B.C.G. on negative reactors must be considered if contact with infection is likely to be maintained. B.C.G. is a culture of living avirulent tubercle bacilli. It is used to give an individual who has never been infected with tuberculosis the acquired immunity which he would receive if he had been infected, without the risk of developing the disease. It is obviously not applicable if the Mantoux test is positive. The chances of serious complication are negligible. At present its use should be confined to infants, children, and adolescents who are living in tuberculous households, and medical students, nurses, and the like who are specially exposed to infection.

Arrangements are being made for it to be available at tuberculosis clinics.

Conclusion

The successful treatment of pulmonary tuberculosis depends largely on attention to detail and willingness to assess deviation from normal. Often a doubt will arise: the clue to correct action is the decision whether serious harm will ensue if the solution of the problem is left until the next visit. If the answer is in the negative the patient should not be informed of the doubt, but action should be taken immediately a decision is made. The average tuberculous patient knows a great deal about himself, so the assumption by the doctor of knowledge which he does not possess is fatal, but it is equally bad to give the impression that the lack of knowledge leads to a lack of interest.

THE ITALIAN HOSPITAL

The Italian Hospital in Queen Square, London, which has been closed since 1941 except for some out-patient activity during the last two years, was reopened on June 19. The Earl of Perth, vice-president of the hospital, received the guests, including many representatives of the Italian colony in London. Cardinal Griffin, Archbishop of Westminster, attended to give his blessing, and inaugural speeches were made by the Italian Ambassador, Duke Gallarati-Scotti, and the Consul-General for Italy, Dr. Vita-Finzi, chairman of the committee of management. It was stated that this hospital, the only one of its kind in the United Kingdom, was founded 66 years ago by the generosity of an Italian, Commendatore Giovanni Battista Ortelli.

In accordance with its constitution, the hospital gives preference in its wards (58 beds) and out-patient department to Italians and Italian-speaking people, but actually it has always been open to the sick and injured of all nationalities, and its British patients have almost equalled its Italian patients in number. The hospital was damaged in the war and also suffered much from dilapidation, so that it became a mere shell, but extensive renovations and improvements have been completed throughout the building, which is now furnished and equipped as a modern hospital, although the structure is Victorian.

Cardinal Griffin spoke of the difficulties which had to be overcome in finding money to put the building in order and in enlisting both medical and nursing staff. The nursing is in charge of the Sisters of Verona, assisted by lay nurses.

A vote of thanks to the governors of King Edward's Hospital Fund for London was moved by Mr. H. P. Winsbury-White, chairman of the medical committee, who explained that the hospital had not been taken over by the Ministry of Health under the National Health Service Act and was still dependent on voluntary contributions. The generous help of the King's Fund was gratefully acknowledged.

Commendatore John Sperni moved a further vote of thanks to the Ministry of Health, the London County Council, and the Corporation of Holborn, in which borough the hospital is situated. The Mayor of Holborn spoke of the appropriateness of having such a hospital again functioning in a part of London which has many Italian associations. The proceedings concluded with the singing of the hymn of the Italian Republic, and the company made an inspection of the wards and departments.

The Earl of Bessborough presenting a congratulatory address on behalf of the Royal College of Physicians and Surgeons of Canada to the President, Sir Cecil Wakeley, on the occasion of the 150th anniversary of the foundation of the College.

ROYAL COLLEGE OF SURGEONS

150th ANNIVERSARY DINNER

In the year 1800, by Royal Charter, the Corporation of Surgeons was constituted the Royal College of Surgeons of England. The 150th anniversary of that event was celebrated with fitting state on June 27, when a dinner at the College was attended by H.R.H. the Duke of Gloucester. Before the dinner the President (Sir Cecil Wakeley), assisted by the Vice-presidents (Sir Harry Platt and Professor Ernest Finch), received addresses from each of the other Royal Colleges and Corporations in Great Britain and Ireland, the Royal Society, the Royal Society of Medicine, the Royal College of Physicians and Surgeons of Canada (presented by Lord Bessborough, an Honorary Fellow of the College), the Royal Australasian College of Surgeons, the College of Surgeons of Paris, the Society of Apothecaries of London, the General Medical Council, the American College of Surgeons, the British Postgraduate Federation, the Worshipful Company of Barbers (which is No. 17 in the order of precedence of the City Guilds), and from 13 universities and four London medical schools.

The DUKE OF GLOUCESTER, in responding to the toast of "The Queen, the Princess Elizabeth, the Duke of Edinburgh, and other members of the Royal Family," recalled the associations of the College with the Royal House. The College was incorporated by charter of George III. To mark its centenary in 1900 the institution of the Honorary Fellowship was approved by Queen Victoria, and the first Honorary Fellow elected was the then Prince of Wales, afterwards Edward VII. In its 150th year, as the first event in the celebrations which culminated that evening, the College had elected the Queen to its Honorary Fellowship. His sister, the Princess Royal, and his uncle, the Earl of Athlone, had similar connexions with the College and greatly regretted their inability to attend the dinner.

Mr. S. C. ROBERTS, Vice-Chancellor of the University of Cambridge, in proposing the toast of the College, spoke of the early history of the Guilds of Barbers and of Surgeons and of their combination in the reign of Henry VIII. It was evident, he said, that the present high level of surgical efficiency was not immediately attained, and he gave some quaint accounts of complaints against surgeons in the sixteenth century. The Royal College since its constitution in 1800 had flourished exceedingly, and all the guests would desire to offer their congratulations on this occasion. They honoured surgery, an art rather than a science, demanding the most exquisite skill and the keenest judgment.

At this point the Duke of Gloucester received on behalf of the College a silver tankard presented by the Royal Australasian College of Surgeons and a medal presented by the College of Surgeons of Paris.

Sir CECIL WAKELEY, in responding, said that during its first hundred years of incorporated existence the College progressed steadily as a licensing body. The Fellowship was instituted in 1843 and the licence in dental surgery in 1859, and the Conjoint Board was set up in 1884. The College was twice enlarged, and the museum and library grew apace. During the last fifty years the progress had been remarkable. He referred to the appointment in 1908 of Sir Arthur Keith (an honoured guest that evening) as conservator of the museum; to the institution of primary Fellowship examinations overseas, the first in Canada in 1929 and in Australia in 1931; to the receipt of some great benefactions and the creation of trusts and scholarships. In 1941 came disaster, when three-fifths of the College and museum were destroyed by enemy action. Within two months of that catastrophe Lord Webb-Johnson (as he now was) was elected President, and during his eight years of office the College, maimed and mutilated as it was, developed a vigour greater than at any time in its previous existence. With the help of generous gifts special departments were formed with professors at their head, and the scientific work of the College was systematically organized. The College had played a leading part in organizing postgraduate study and had strengthened imperial ties by the institution of Commonwealth travelling scholarships.

Thanks to the foresight of Lord Webb-Johnson the College had become possessed of nearly the whole of the south side of Lincoln's Inn Fields, which would enable it to benefit from the well-timed generosity of Lord Nuffield, who was giving £250,000 for the erection of the Nuffield College of Surgical Science, where about 100 postgraduate students would be provided with the facilities of collegiate life. With the assistance of the Wellcome trustees, of many kindred institutions, and, above all, of the Fellows of the College who had contributed so loyally to the restoration and development fund, it was planned to build a great hall and enlarge the museum. It was the determination of the College to fulfil with all the energy it could command the duty laid upon it under the charter of George III—the promotion and encouragement of the study and practice of the art and science of surgery.

Lord WEBB-JOHNSON proposed the health of the guests. After a reference to the earlier history of the College he said that the greatest happiness on an occasion like this was to be surrounded by friends, and the College was fortunate in that the friends who surrounded it were so representative and distinguished. The College had passed through a crisis, and in that crisis had sought and found friends in all parts of the world.

Sir JOHN ANDERSON, who responded, referred to the progress of surgery and the new hope it gave to sufferers from abnormalities and diseases formerly regarded as mortal. Thanks to surgery the King had been restored to an active normal life. The achievements of plastic surgery were frequently evident, and by various new procedures lives were saved and suffering diminished. He referred with appreciation to the fact that recently a surgeon had left "his plumber's tools" behind him and stretched with his fingers a valvular orifice of the heart. In congratulating the Royal College on its notable anniversary

its guests would desire to acclaim the profession, at the head of which the Royal College with its sister institutions stood.

After the dinner the guests visited the museum and the council room, in which were displayed John Hunter's anatomical specimens illustrating some of his best-known work and specimens which showed the progress towards the rebuilding of the museum series destroyed by enemy action in 1941. It was stated that 158 new specimens had been prepared so far to replace the losses in the anatomical museum, and 215 to replace the losses in the comparative osteology collection. Exhibits were also on view from the odontological series, the unit illustrating ophthalmological research, and a series of colour photographs illustrating the diseases and injuries of modern warfare and their treatment by surgery and antibiotics. The College plate was on view, including the latest acquisition, presented by the Worshipful Company of Barbers, a replica of the cup given to the Barber-surgeons Company by Henry VIII. The records of the College were also shown, including the roll of Honorary Fellows, containing the signatures of all who had received this distinction from Edward VII on July 24, 1900, to the present Queen on March 20, 1950.

HARVEIAN SOCIETY DINNER

LORD LINLITHGOW'S TRIBUTE TO THE G.P.

A large gathering assembled in the Grocers' Hall on June 29 for the Buckston-Browne–Gray-Hill Dinner held by the Harveian Society of London, the president, Dr. R. R. Trail, being in the chair. After the company had toasted in silence the memory of William Harvey and of Sir George Buckston-Browne, the Marquess of Linlithgow proposed the health of the Harveian Society in a thoughtful speech which, despite the heat of the evening, was listened to with deep appreciation.

Lord Linlithgow said that as a layman he had had a long and varied contact with and interest in scientific research. He had seen much money spent on lavishly equipped premises and had been saddened to note that "in some despite the marble and the gilding the sacred fires are untended and the altars cold." The limiting factor was the quality of the research worker. "It is the man that matters." Harvey could have had no research team in the modern sense any more than Pasteur had two hundred years later. "Yet Harvey was very far from being alone. For by great and patient labour he had acquired all the knowledge available in the schools, all such past experience as could be gathered from the written word and amongst contemporaries an unequalled mastery of anatomy founded in the untiring exercise of dissection." There was, Lord Linlithgow believed, nothing to equal Harvey's principal achievement in its significance, its dramatic quality, and its completeness. Though Sir Francis Bacon had employed Harvey he remained without knowledge of his physician's great discovery. It would be of the greatest interest to know whether the Lord Chancellor had called in Harvey as a general practitioner or as a specialist. In his essay "Of Regimen of Health" Bacon wrote this on choosing a doctor: "Forget not to call as well the best acquainted with your Body as the best reputed of for his faculty." Lord Linlithgow hoped that this, which had been so clearly understood 350 years ago, was not now to be forgotten. He went on to say:

The Family Doctor

"For my part, I have a great fear that the position of the family doctor is in serious jeopardy. I doubt very much if the public at large has yet understood how much is at stake in this issue. I would like to say that where medicine in any of its branches is concerned I am without political bias. What concerns me, and most other men of good will, is the health, efficiency, and happiness of the common run of men and women. Nor am I directing my argument this evening to the economic aspect of the National Health Act, though it is true that in my judgment its impact upon our overstrained economy may well—and before many months pass—provide one of the sharpest political issues ever presented to this country. Nor, again, would it be reasonable to expect perfection at the start of so extensive a scheme. Indeed, it must take much experience and some years before the machine can be fully run in.

"What troubles me is that, unless I am mistaken, signs are multiplying to show that the status and usefulness of the general practitioner have already suffered damage, and that unless something is done in good time the public interest is going to be gravely hurt. I admit that my fitness to judge is not strongly founded; for I am no more than a private citizen who reads the newspapers and such literature on these topics as he can make time for. But to-night I am content to present myself to you as a patient, and one insured under the scheme. Not so long ago we patients were encouraged to hope that prevention of disease rather than its cure was to be the target, and I can conceive of none more worthy. But does not prevention depend upon the early recognition of aberrations from the normal? And who in the world is going to do me this service of very early diagnosis if it is not the G.P., who is, or ought to be, my family doctor, the person who as early as 1620 was valued 'as the man best acquainted with my body'? Please, for my sake, cherish him. Please do not leave him and his kind in deepening isolation, cut off from the springs of progressive medicine, deprived of effective contact with the hospital services! Help him to keep abreast of progress and to use effectively the tremendous armoury of therapeutic substances which, almost from day to day, research is providing. Give him a little time in which to think as well as time to work. Make the general branch a worth-while career such as may attract at least its share of the best students.

"I value specialization as much as any man; and if the nature of my case warrants it, I wish my G.P. to send me to a specialist without delay. I must hope that the road to him may not be clogged by large numbers of patients whose state does not, in fact, need his ministration or give warranty to those who have directed them to him. Am I not right in holding that the only way to set right this last matter is to raise the status, capacity, and performance of the G.P.? As a patient, I desire, in fairness both to the medical profession and to myself, that doctors should be adequately remunerated. I am properly anxious that no practitioner should be driven, on grounds of bread and butter, to extend his practice beyond the utmost number of patients to which he can give proper care. I am aware that many issues arise of great moment to the medical profession. Then again, I am left in no doubt about the political significance of the National Health scheme or the cleavage of opinion upon certain of its aspects, although all parties are pledged to support it. For myself and my fellow patients, I will crave but one boon. It is that all concerned should bear constantly in mind that we patients are the most important party in this whole matter, and that it is our welfare that is at stake."

Lord Linlithgow ended by making some remarks about his interest in tuberculosis. With the president of the Society he had taken part in the work done at Papworth and at Enham-Alamein. His father-in-law, the late Sir Frederick Milner, had been one of the earliest and most devoted supporters of Papworth. Lady Linlithgow shared her father's enthusiasm, and when he (Lord Linlithgow) went to India she dedicated herself to the task of founding there an organization for coping with the fearful problem of tuberculosis. In British India and in the Indian States Lady Linlithgow succeeded in raising a fund of about £800,000, which was disbursed upon the establishment of clinics and general anti-tuberculosis measures. When they left India in the autumn of 1943, Lady Linlithgow had succeeded in establishing a tuberculosis association in every Province and in almost every State. These were almost without exception conducted by Indians.

In response to the toast, the president, Dr. R. R. Trail, in a speech of much learning compared the England of Harvey's day with England now. He gave a fascinating account of the manners and customs of those who lived in that turbulent period of British history. Harvey had lived at the time of the Armada and of the Civil War, had been physician to James I and Charles I, had been alive when Shakespeare and Milton were alive, and, when he died at the age of 80, had witnessed revolution and regicide. The toast of the guests was proposed with eloquence and wit by Dr. M. C. W. Long. He reminded those present that the dinner they were enjoying had been endowed by Sir George Buckston-Browne who gave the Harveian lecture in 1901 on urinary surgery. Gray Hill, with whose name the dinner was also associated, believed in good fellowship and in the ordinary doctor. Among the guests present he welcomed in particular Dr. Arthur Allen, of the U.S.A.

The evening being late, response to the toast of the guests was made with admirable point and brevity by Lieut.-General Sir Frederick Browning and Dr. W. Russell Brain, President

of the Royal College of Physicians. Dr. Brain, asking what was the state of the circulation of medicine to-day, observed that in consulting medicine they had some large vessels, and in the peripheral circulation, where the most important things took place, there were the general practitioners. Nothing could happen in one part of the circulation without effect on the rest. He, too, stressed the importance of the future of general practice and of general practitioners.

TUBERCULOSIS IN SOUTH KOREA

According to a report issued by the World Health Organization, tuberculosis is the most widespread of all diseases in Korea and the most serious public health problem. The statistics available in the country are unreliable, but in 1947 the death rate was 52 reported deaths per 100,000 population. However, according to local estimates the actual annual death rate is probably more than 300 per 100,000. The disease is present in all forms, but the bovine type is rare, since cow's milk is not commonly drunk in Korea.

Of children entering primary school at the age of 7, about 30% are tuberculin-positive; when they leave at the age of 14 to 16 about 50% to 60% are tuberculin-positive. The percentage seems to be higher in Seoul than in rural areas. Among college students 84% of the males are said to be tuberculin-positive, and 73% of the females.

Some information on the prevalence of pulmonary tuberculosis was obtained by mass-radiography surveys during 1944–9 by Dr. C. S. Cho, formerly professor of radiology at the National Seoul University Medical School. "Active tuberculosis" is defined as "progressive changes in the *x*-ray picture of the lungs, including changes in the apex and elsewhere, pulmonary gland infiltration, and pleurisy signs." In accordance with this definition the incidence of active tuberculosis was found in the surveys to be 3.2% in orphanage children, 1.7% in urban, and 0.9% in rural primary-school children. It was 1.2% in boys at middle schools, and 2.4% in girls. Among college students it was 3.2% in males and 2.7% in females. Among textile workers the incidence was 2.8%, metal industry workers 1.5%, rubber industry workers 2.7%, and clerical workers 3%. Out of 426 children admitted to the paediatric ward of the Seoul Red Cross Hospital in 1949, 134 (31.4%) had tuberculosis; and out of 8,647 children examined at the paediatric out-patient clinic of the Taegu Presbyterian Hospital in 1949, 1,266 (14.7%) had tuberculosis. Mass-radiography surveys showed that about 2% of the total population of twenty million in South Korea had active tuberculosis. The total number of tuberculosis beds was 530, but there were no beds for tuberculous children. The report states that there are about 3.800 doctors, 1,500 nurses, and 1,500 midwives in South Korea, though only half of the nurses and midwives are in practice.

Among measures suggested for controlling tuberculosis are: sending a W.H.O. consultant to advise on training in medical schools and on the development of public health measures; additional laboratory equipment; and—urgently needed—more beds for tuberculous cases.

An account of the Nutrition Research Laboratories at Coonoor, India, is given in a pamphlet written by the director, Dr. V. N. Patwardhan. He outlines the history and development of the laboratories, and the great work done by Sir Robert McCarrison, the founder-director, on research into nutrition in India. Inquiries into the nutritive value of foodstuffs have been carried out at the laboratories, as well as diet surveys and research into the nutritional status of the people and into nutritional deficiencies. Many medical and other workers have been trained there, including social welfare workers, health visitors, and teachers. In an introduction Rajkumari Amrit Kaur, Minister of Health for India and President of the World Health Organization, emphasizes the need for nutritional research in India and of raising the standard of nutrition there.

MEDICAL LIBRARIANSHIP IN GREAT BRITAIN

MEDICAL LIBRARY ASSOCIATION CONVENTION

As principal guest speaker at the annual convention of the Medical Library Association held at Boston, Massachusetts, Mr. W. J. Bishop, librarian of the Wellcome Historical Medical Library and honorary secretary of the Medical Section of the Library Association of Great Britain, opened the proceedings on June 21 with an address on medical libraries and librarianship in Great Britain.

Taking as his theme the part played by medical libraries in the advance of medicine, Mr. Bishop examined the means by which their usefulness has been, and could be yet further, improved. Most important were inter-library and international co-operation; the organization of librarians into professional groups for the mutual exchange of information and ideas; and the recruitment, training, and examination of juniors in order to build up a well-educated and highly trained body of registered medical librarians. The first attempt in Britain along these lines had been the Medical Library Association of Great Britain, which was founded in 1908 and came to an untimely end in 1910. It owed its origin to the fact that Professor Walker Hall in 1906 moved from Manchester, where there was an excellent medical library, to Bristol, where there was a poor one. Mr. C. Clayton, then librarian of the Manchester Medical Society, served him so well with inter-library loans that he suggested that this practice should be extended and organized by an association of medical libraries. Other provincial libraries, in the same stage of development as Bristol, saw great possibilities in the scheme. The big London libraries were not so anxious to see their stock dispersed far and wide.

The outcome was that 32 library representatives attended a preliminary conference held during the annual meeting of the British Medical Association at Sheffield in 1908. In January of the following year, at a meeting in the Leeds School of Medicine, a committee was formed with Osler as its president. The inaugural meeting of the new Medical Library Association was duly held at Queen's University, Belfast, on July 28, 1909, again on the occasion of a B.M.A. annual meeting. Osler gave an address on "The Medical Library and Postgraduate Work," and an exhibition of manuscripts and rare books was arranged in the university.

In July, 1910, once more "by kind permission of the British Medical Association," the second annual meeting was arranged in London at the same time as the B.M.A. meeting, and several papers were read. Thereafter little more was heard of the M.L.A., probably because its energetic secretary, Mr. Clayton, left the Manchester Medical Library and nobody was found to take his place. Within a short time the B.M.A. Library began to fulfil one of the M.L.A.'s objects by improving its facilities and introducing postal loans. Then after the 1914–18 war Professor Leiper and his assistants compiled the "Union Catalogue of Periodicals" (published by the B.M.A. in 1923), which had been another of the chief aims. Short as was the existence of the Medical Library Association, it had achieved something in stimulating these advances. The reasons for its failure, in Mr. Bishop's opinion, were the faulty conception of an association of libraries instead of librarians; the small number of well-trained medical librarians at that time; and the prominence given to the study of medical history, a good aim in itself but not one of the chief functions of such an association.

Medical Section of the Library Association

Sir John MacAlister, secretary and librarian of the Royal Society of Medicine and a former secretary and president of the Library Association, writing in 1910 gave it as his considered opinion that the scheme would have stood a better chance of success if it had been constituted as a branch of the Library Association. Later events showed the wisdom of this opinion. When a group of London medical librarians suggested in 1947 that the time had come to establish a professional body,

preliminary discussions resulted in its formation as a subsection of the Library Association. It is significant that on that occasion the initiative was taken by librarians themselves, that the stimulus came from London, which had proved the stumbling-block in the old association, and that it quickly received the warmest support from medical librarians throughout the country, as well as encouragement from the parent association. Prominent among its aims were the establishment of an exchange system, the compilation of union lists and similar co-operative projects, and the encouragement of inter-library loans. At the preliminary meeting held at Chaucer House, the headquarters of the Library Association, on October 4, 1947, there were 33 librarians present; by October 29 the new body already had 60 members. By the end of 1948 membership reached 100, and the group was accorded the status of a full section of the Library Association. Present membership is 180 and is rising steadily.

An exchange scheme was established within the first three months of the existence of the new section, and by now many thousands of periodicals and books have been collected and distributed to libraries at home and abroad. Valuable work has been done by a special committee studying the selection of subject-headings for medical libraries, and another committee has published a select book-list and hints on the organization of medical libraries in hospitals, which last has been asked for by more than 300 hospitals in all parts of the world.

Turning to the future, Mr. Bishop spoke of the "crisis" in medical bibliography: the cessation of the index-catalogue, the myth of "complete coverage of the literature," when the year's output in one specialty might take ten years to read; and the problems of selecting from and organizing the literature, problems which could not be solved by any of the mechanical methods now becoming fashionable. The best solution, said Mr. Bishop, lay in the improved training of the medical librarian so that he could act as an expert guide through the complexities of the overwhelming mass of periodical literature. In this matter the infant Medical Section of the Library Association had gone ahead of the veteran Medical Library Association of America and had already succeeded in introducing into the final examinations for the Fellowship of the Library Association special papers in medical literature and medical librarianship. The syllabus, which is of university standard, is exacting and comprehensive and could be mastered only by assistants who had spent some years of hard work and study in a medical library.

In concluding his address Mr. Bishop made a plea for a movement in medical librarianship back to the study of the reader and the book, urging his audience to remember that the library was one of the greatest factors in medical progress.

At the end of the Boston Convention on June 25 Mr. Bishop began a tour of medical libraries in the eastern States of the U.S.A. and in Canada.

A two-day conference is being arranged jointly between the Institute of Biology and the Atomic Scientists' Association, with the support of the British Association, on the subject of atomic energy and its biological hazards. It will be held at the Royal Institution, Albemarle Street, London, W.1, on October 20 and 21. Other societies interested in the meeting include the British Institute of Radiology. The object of the conference is to consider, on the basis of the available facts from both the biological and physical aspects, the possible biological hazards arising from the development and application of atomic science now and in the future. The meeting will comprise four sessions as follows: (1) Biological and medical effects of nuclear radiations. (2) Tolerance levels and measures of protection. (3) Biological implications. (4) Atomic energy and the future. In each session opening addresses will be given by invited speakers, and they will be followed by discussion. Preliminary arrangements are being made by a joint committee, of which the chairman is Professor Alexander Haddow, of the Chester Beatty Research Institute, Royal Cancer Hospital, London.

ORDER OF ST. JOHN OF JERUSALEM

The *London Gazette* has announced the following promotions in, and appointments to, the Venerable Order of the Hospital of St. John of Jerusalem:

As Knight: Dr. J. H. G. Robertson, C.B.E. *As Commanders (Brothers):* Surgeon Captain T. Madill, O.B.E., M.B., R.N., and Dr. J. C. Ashton. *As Officers (Brothers):* Surgeon Captain A. W. McRorie, M.D., D.P.H., K.H.P., R.N., Colonel F. A. Bearn, C.B.E., D.S.O., *M.C.*, M.D., Brigadier T. W. Davidson, M.B., Lieutenant-Colonels E. H. R. Altounyan, O.B.E., *M.C.*, M.D., F.R.C.S., and E. G. Montgomery, M.B., Messrs. H. S. Taylor-Young, F.R.C.S., and I. Newton, F.R.C.S., Drs. H. Middleton, *M.C.*, D. A. B. Hopkin, D. J. Johnson, N. M. Maclennan, B. O. Bradshaw, P. Pringle, C. W. Isaac, S. H. Ward, R. A. H. Fulton, E. E. Butler, and W. S. Wallis. *As Associate Officers (Brothers):* Squadron Leader F. S. Krusin, M.R.C.S., L.R.C.P., and Dr. T. Seshachalam. *As Serving Brothers:* Surgeon Commander D. F. Walsh, M.B., F.R.C.S., R.N., Squadron Leader L. E. Claremont, M.R.C.S., L.R.C.P., Mr. J. S. Grant, M.D., F.R.C.S., Drs. G. M. Kay, T. W. H. Porter, A. G. N. Weatherhead, L. E. Jones, R. V. C. Richards, J. A. Thompson, W. W. Wilson, R. C. J. Meyer, D. K. Fisher, R. W. S. Ashby, A. Strang, D. R. Edwards, and S. L. Mainland. *As Associate Serving Brothers:* Drs. A. A. Masser and F. Rassim. *As Serving Sister:* Dr. Margaret Melvin.

Nova et Vetera

JOHANN MIKULICZ-RADECKI

Last month Sir Gordon Gordon-Taylor led a delegation from the Royal Society of Medicine to attend the 67th Congress of the Deutsche Gesellschaft für Chirurgie, which was held on May 31 at Frankfurt-am-Main. The occasion coincided almost exactly with the centenary of the birth of the German surgeon Johann Mikulicz-Radecki. In paying tribute to his memory, Sir Gordon Gordon-Taylor said:

"It is a proud privilege that is granted me to pay a tribute to the memory of a great German surgeon, for the centenary of the birth of Johann Mikulicz-Radecki coincides almost exactly with the date of this congress of German surgeons, of which he was so strong and stalwart a pillar during the latter half of the nineteenth century and in the first few years of the present one. I am further honoured in following this morning so famous a surgical figure as Ferdinand Sauerbruch.

"Not only am I here in Frankfurt to pay this tribute to Mikulicz on behalf of the Royal Society of Medicine, of which I am acting president at this juncture, but I am also commissioned by the President of the Royal College of Surgeons of England, the headquarters of British surgery, to associate the name of our surgical college with this eulogy directed to the memory of a master surgeon. Nay, if I might venture for one minute to assume a wider responsibility, I feel sure that to-day I am speaking for all the surgeons of all nations in the world in rendering homage to that great shade, who did so much and achieved so much to promote the science and art of surgery.

"I am by no means assured that the subject on which I myself propose to speak later on—interinnomino-abdominal amputation—is one that would have particularly commended itself to the famous surgeon, for in the well-known textbook of surgery which was my surgical bible in more youthful years and of which he was joint author with Ernst von Bergman and Bruns one senses a tendency to relative conservatism in respect of the treatment of neoplasms in the vicinity of the hip.

"The exteriorization method of ablating cancer of the large intestine, for ever associated with the name of Mikulicz, must always rank as the most monumental milestone in the onward progress of colonic surgery, and the so-called Mikulicz–Paul technique did far more to promote the safety of colonic resection than any single factor, save perhaps the sulphonamide or streptomycin therapy of very recent years. Not only were the lives of countless cancer sufferers all over the world saved by the Mikulicz technique, but during the last world war the application of the principle of exteriorization of the colon was

almost universally applied by British surgeons to the treatment of war injuries of the large bowel and did much to diminish the mortality of this serious lesion.

"As one of the surgical acolytes of the famour Theodor Billroth, of Vienna, he assisted at the actual birth of gastric surgery, and in 1881 at this congress he reported three cases from the Vienna clinic in which Billroth had performed gastrectomy, one of them being the first successful case ever performed. By a curious trick of fate Mikulicz was destined to die at a premature age from malignant disease of an organ the surgery of which he had done so much to promote.

"This is no place nor is there the time to catalogue all his achievements, but in 1885 he was the first to operate for gastric haemorrhage. The pioneer is rarely the one who exploits, and Mikulicz was not spared to see the operative treatment of haematemesis established as the appropriate method of treatment in certain cases; a sweet reasonableness on the part of the internist towards the problem has only been secured after fierce discussion and by hard endeavour, and in this German-speaking surgeons have played no unimportant a part. Nor in Britain has the subject passed unnoticed, and my friend Norman Tanner and even I myself have taken a very active interest in the pioneer work of Mikulicz, Finsterer, and others.

"In every generation there are a chosen few who shed a special lustre on it by reason of their character, their attainments, and their record of service, God's greatest gift to man; and when the riband of surgical history is finally unrolled, in glittering and golden letters will be found inscribed thereon the name of Johann Mikulicz-Radecki. I offer to him, on behalf of surgeons everywhere, my tribute of laurel for honour and of rosemary for remembrance."

Reports of Societies

SOME UNUSUAL CASES

Dr. A. HILLYARD HOLMES delivered his presidential address, on April 5, to the Manchester Medical Society. He referred to the amalgamation of five societies to form the newly constituted Manchester Medical Society, with sections of medicine, pathology, surgery, anaesthetics, and odontology. The oldest of these societies, the Manchester Medical Society, was formed in 1834; the present Pathological Society was formed in 1885 to replace the microscopical section of the Medical Society, which had been in existence since 1875. The other three societies were of much more recent origin.

After references to the early meetings of the Medical Society and to some notable presidential addresses, the speaker detailed a number of interesting clinical cases, illustrating them by lantern slides. Three cases of haemoptysis proved to be due to hydatid cysts, malignant haemangioma of the right auricle, and a congenital pulmonary cyst, respectively. In the last-named condition haemoptysis had recurred for nearly twenty-five years, and *x*-ray films taken in 1928 supported the diagnosis.

There followed descriptions of a case of dissecting aneurysm of the aorta, observed for three and a half years, and of a congenital cerebral aneurysm causing an isolated third nerve palsy, observed over fourteen years and finally treated by ligation of the artery. Brief allusion was made to four diseases which were incurable when the speaker was a student—namely, Addison's disease, pernicious anaemia, tuberculous meningitis, and diabetes mellitus with coma.

Sir HARRY PLATT proposed a vote of thanks to the president.

The paraplegic branch of the British Legion performs a useful service for its members in producing a quarterly magazine called the *Cord*. It gives disabled readers up-to-date information about the various appliances designed to help them, and mingles light comment on the difficulties of the disabled with instruction on how to overcome them. Information may be obtained from the editor at 114, Arran Road, Catford, London, S.E.6.

Correspondence

Stress and the General Adaptation Syndrome

SIR,—In view of the fate which has overtaken all previous attempts to construct a monistic pathology and its corollary, monistic therapeutics, it required no little courage on the part of Professor Selye to make the attempt, especially at a time when the knowledge of disease is a thousandfold greater than it was at the time of the systematists who have preceded him. Moreover, the despair into which we are plunged by the centrifugal force of scientific medicine makes any attempt at integration welcome and compels us to give it our earnest consideration and at the same time to subject it to critical analysis.

Any such system must satisfy two criteria: first, it must be sufficiently catholic to embrace all pathological and clinical evidence whether this is obtained collaterally or directly; secondly, the theory on which it is based must be logically unassailable.

As to the first, Professor Selye (*Journal*, June 17, p. 1383) lists a large number of heterogeneous diseases which are responsive to cortisone. I do not for a moment doubt the validity of his claims. It is, however, worth pointing out that a list equally long and equally heterogeneous can be and has been made of diseases responsive to *x* rays, though some of the claims have not stood the test of time. The remarkable thing is that though the two lists are not identical they have a large number of diseases in common: eczema, dermatitis, rheumatoid arthritis, spondylitis, Hodgkin's disease, the leukaemias, lymphosarcoma, Boeck's sarcoid, hyperthyroidism, psoriasis, keloid, etc. If *x* rays have not the dramatic action of cortisone on rheumatoid arthritis, what could be more dramatic than their action on many forms of cancer, a field in which cortisone is useless? We thus have two large groups of diseases of widely differing pathology whose members are partly identical and partly different, responding to two agencies as far apart in origin and character as they could possibly be. Are we to conclude that *x* rays act not directly but through the intermediation of the hypothalamus–hypophysis system? I find this hard to believe. Moreover there are many diseases which respond up to a point, and usually almost the same point, when treated by the most diverse agencies. Hodgkin's disease, for example, responds to *x* rays, to urethane, to derivatives of mustard gas, and now to cortisone and A.C.T.H. All kinds of things retard malignant growth to some extent. How do these facts square with Professor Selye's theory?

Turning now to the theory itself, I quote extracts verbatim from the opening paragraphs of his address. Each is followed by the deductions which, according to my reasoning, should be drawn from it: the italics are mine.

1. *Living organisms can respond to stress as such. . . .*"
   Stress is something to which organisms can respond.
2. "*We called this response the general adaptation syndrome.*"
   The general adaptation syndrome is the means by which the organism responds to stress.

3*a*. "*Anything that causes stress endangers life, unless it is met by adequate adaptive responses.*"
   Stress is a condition caused by anything which endangers life in the absence of adaptive responses.

3*b*. "*Conversely, anything that endangers life causes stress and adaptive responses.*"
   Stress is a condition caused by anything which endangers life; it is accompanied by adaptive responses. 3*a* and 3*b* are therefore not the converse the one of the other; they are partly identical and partly inconsistent.

4*a*. "*In the general adaptation syndrome the manifestations of passive non-specific damage are intricately intermixed with those of active defence.*"
   The general adaptation syndrome has two components, damage and defence. It is not clear to me how damage can be part of an adaptive process. Note that damage is passive.

4*b*. "*This* [i.e., 4*a*] *is an inherent characteristic of the stress which elicits the general adaptation syndrome.*"
   The dual nature of the general adaptation syndrome (4*a*) is a characteristic of the stress which causes the general adaptation syndrome.

5. *"In addition to damage and defence, every stressor also produces certain specific actions. . . ."*

In the diagram which accompanies this paragraph stressor is represented as the cause of the whole train of reactions, but stress which forms part of the title of the article and the pivot of the argument is omitted. The word "stressor" is introduced incidentally and without being defined. In common parlance it should of course mean something which causes stress, and this would seem to be its meaning here if we assume with 4*b* that the two things which it produces—namely, damage and defence—are the components of stress. Since, however, damage and stress are also described as the components of the general adaptation syndrome (4*a*) which is caused by stress, stressor seems to be the same as stress.

6. *"In the biological sense stress is the interaction between damage and defence, just as in physics tension or pressure represents the interplay between a force and the resistance offered to it."*

Damage has been represented as passive (4*a*). But a thing that is passive cannot take part in an interaction. Similarly, in a physical system a resistance which is passive cannot play. Stress must therefore be the unilateral action of defence upon damage, that is, of one of its own components upon the other. To return to the physical analogy, the truth is that tension is not the interplay of force and resistance (when resistance is active) nor the play of force upon resistance (when resistance is passive). It is the *result* of interplay or play as the case may be. Stress therefore becomes the result of the action of one of its components (defence) upon the other (damage). But stress has been described as the action itself. Therefore stress is not only itself but the result of itself. According, however, to 1 and 2 (above) all living organisms can respond to stress by the general adaptation syndrome, which, according to 4*a*, consists of damage and defence. Therefore stress, in addition to being itself and the result of itself, is also the cause of itself.

The above remarks, I assure Professor Selye, are not dialectic fireworks but a sincere expression of my intellectual difficulties and of my desire to comprehend his meaning. As an earnest of my good will may I express my admiration of his humility, especially welcome in these days of scientific arrogance? "The complete comprehension of life," he says, "is beyond the limits of the human mind." He thus echoes Herbert Spencer's belief: "Both science and religion must recognize that the Power which the Universe manifests to us is utterly inscrutable."—I am, etc.,

Cambridge. FF. ROBERTS.

SIR,—The Heberden Oration and your leading article of June 17 provide much material for thought and reflection: thought, to grasp the meaning and implications of the present outlook; reflection, to discern what progress the passage of years has brought, to distinguish revolutionary theories and new ground from ideas which are merely modifications of earlier thought.

Often in the natural course of evolution conceptions can be so developed, expanded, modified, elucidated, or integrated that they finally present as an entirely new creation something whose advent might possibly be expected to herald the opening of a new era in medical progress.

Your leading article implied that the theory of stress diseases and adaptation evoked little enthusiasm until the effect of hormones in the treatment of rheumatoid arthritis was so dramatically demonstrated. This may be so; but it is difficult to believe that practitioners in the past were wholly oblivious to the reactions of the individual or his adjustments to hostile assault, stress, and environment.

A conception so all-embracing as the general adaptation syndrome must inevitably initiate a volume of research work covering a wide field, and it might not be unhelpful to future investigations if a review of earlier ideas were made at this stage.

In September, 1931, I moved to unearth the opinions of the giants of the day about rheumatic disease in general. This is what I read:

Poynton and Schlesinger[1]: "New methods of approach are badly needed, and, above all, fresh conceptions of disease. . . . Real advance will only be made by breaking away from traditional experiments with cultures *in vitro*, and by paying more attention to the reactions of the patient."

Macinder Wetherby[2]: "Clinically I am unable to place a sharp dividing line between cases termed rheumatic fever, and those with an apparently similar onset that progress to chronic articular involvement."

Rolleston[3] noted how the manifestations of rheumatic disease changed with the passage of time.

Swift, Derrick, and Hitchcock[4]: "The state of the tissues of the patient is the most important characteristic factor of the disease, and the specificity of the streptococci recovered may play a relatively unimportant role."

Gross[5] showed that the nature of a reaction was often influenced by the age of the patient, citing cardiac disease in rheumatism, and nephritis.

Pemberton,[6] after the 1914–18 war, was able merely by prescribing rest and a reduced carbohydrate diet to cure many cases of atrophic arthritis, even when focal sepsis was present. He gave a notable contribution to the work when he demonstrated that in arthritis not only was there lowered blood sugar tolerance, which recovered as the patient improved, but that even after this the impaired tolerance could be reproduced in 40% of patients by interference with the peripheral circulation. He also wrote: "Extreme nervousness, apprehension, and irritability are conspicuous features, also depression and melancholia, while many examples of functional insanity originate from the common background productive of arthritis and should be regarded as branches of the same pathological state."

The day of the haemolytic streptococcus and focal sepsis was waning. More and more did workers tend to concentrate upon the reactions of the individual. As Pemberton said: "It is necessary to admit a disturbance of underlying function expressing itself widely throughout the economy and subject to many influences."

In 1932 and 1933 cases of rheumatic disease which occurred in my own limited sphere of general practice were investigated in a somewhat elementary fashion; the findings were submitted in 1934 as a thesis entitled "The Autonomic Nervous System and the Rheumatic Diathesis." The following extracts are taken from it:

(1) "In acute rheumatic fever of children, subacute rheumatism of the adult, and many if not all forms of chronic rheumatism one complete disease, and one only, is confronted."

(2) "Rheumatic disease, with diabetes, exophthalmic goitre, and asthma, should be defined as offshoots of the same pathological root, and that the victims, through weakness in their reaction to physical and mental bombardment, render themselves prone to attack."

(3) "Physiology furnishes proof daily of the influence of psychological stimuli on this mechanism. One sees the palpitation or cold sweat of fear, the blush of embarrassment and anger, or the dilated pupils of the startled, but it may not be so apparent that in the susceptible not only these acute exacerbations, but also prolonged fatigue, worry, overwork, apprehension or gross mental strain, may either immediately, or over the course of time, give rise to definite pathological conditions which involve some portion of the autonomic endocrine scheme."

(4) "Other hostile factors exist, in the form of psychical unrest, emotion, mental conflict, nervous shock, anaemia, chill, barometric variations, susceptibility to which has been found to be a characteristic weakness of the rheumatic subject."

(5) "An unstable autonomic system is a prominent feature of the rheumatic state. It is usually an inherited and familial weakness, which prevents the subject from responding adequately and efficiently to external influences, whether physical or mental."

(6) "It is not possible entirely to resist the suggestion that conditions, whether physiological or pathological, which are associated with high blood sugar are also those which are favourable to the onset of rheumatism, and the autonomic system is the only connecting link whereby these conditions can be co-ordinated in the mind's eye."

(7) "Each ailment invested its victim with a power of antagonism to any other one of the diseases of the group. It was as if the severance of the weakest link had relieved the tension throughout the whole structure of the system."

(8) "The controlling mechanism of the autonomic endocrine apparatus is in the hypothalamus, which is connected with the posterior lobe of the pituitary gland; furthermore, this part of the pituitary may even influence the controlling nuclei of the autonomic system in the hypothalamus through a recently described vascular portal circulation (Cushing[7] and Fulton[8])."

(9) "Focal sepsis itself, or at any rate its activity, may be a phenomenon induced by the rheumatic state."

(10) "Treatment must be adequate to deal with the effects of emotion, exhaustion, and shock."

Sufficient has been written to show that eighteen years ago we had begun to direct our gaze towards a picture not very dissimilar from that which the brilliant work of Professor Selye has now unveiled before us.

His words describe the background[9]:

"Adaptation to our surroundings is one of the most important physiological reactions in life; one might perhaps even go so far as to say that the capacity of adjustment to external stimuli is the most characteristic feature of living matter. It is not unexpected therefore that some of the most common diseases of man appear to be diseases of the adaptive mechanism."

Previously one could only say:

"Examples show the association between dysfunction of the endocrine organs and rheumatic disease. Naturally the story is incomplete, for insufficient knowledge of body chemistry and endocrine action leads into a veritable maze of complexity. But this halt in progress has its function, for it deflects the mind from the test tube to the simpler conception of man as a part of the universe, endowed with a pedigree, subject to assault, and girt with environment."[10]

When, in 1932–3, focus began to be concentrated on the defensive reaction rather than on the invader, it at once became obvious that a much closer affinity existed between all forms of rheumatic disease than had previously been thought possible; further, that other pathological entities should be added to this group, for the common factor was stress. But one never imagined that the list of diseases could reach its present dimension, for then there was no knowledge of Professor Selye's valuable pathological and experimental work; this reason also accounts for the fact that more emphasis was placed on the autonomic and vascular aspect of the defence than on the endocrine. There were other divergences. Small importance was assigned at that time to the role of the anterior pituitary gland and suprarenal gland. They were merely considered as part of the general endocrine scheme; nor would a postulate which held that attack by one disease of the group rendered the individual relatively immune to assault by another agree with the outlook of to-day. Hypertension may still create difficulties, for a characteristic feature of the rheumatic state is low blood pressure. These, however, are but fragments. The main picture remains. Its title has not changed. "The gods approve the depth but not the tumult of the soul."

Professor Selye's publications form a milestone in medical progress. Not only this, they are of absorbing interest to anyone who, in the past, may have striven, however crudely and however inadequately, to comprehend the nature of the reaction of the host to the assaults of his environment.—I am, etc.,

High Wycombe, Bucks. G. S. W. EVANS.

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SIR,—Professor Hans Selye's article on his concept of the adaptation syndrome in the *Journal* of June 17 (p. 1383) was of great interest to me. I noticed that he did not include sprue and allied conditions in the list of diseases which have responded to A.C.T.H. and cortisone.

I have thought for some years that sprue might result from adrenal strain or "stage of exhaustion." Sprue occurred in "epidemic" proportions in the Burma campaign, where stress existed, and the added upset of salt and water metabolism could well have had a "specific action" on the adrenals; also the diarrhoeal diseases which abounded provided the "extraneous conditioning of the target organ." There is much suggestive evidence that the adrenal may play some part in fat absorption and in the aetiology of sprue. Perhaps A.C.T.H. and cortisone have been tried and found wanting? I know that some adrenal cortical hormones have been tried in sprue without success.—I am, etc.,

Belfast. J. H. D. MILLAR.

Delayed Feeding of Premature Infants

SIR,—Employing similar methods to those of Professor W. Gaisford and Dr. S. Schofield (*Journal*, June 17, p. 1404), we have been using delayed initial feeding of premature newborn infants in Cardiff for the last eighteen to twenty-four months. In our experience we confirm most of the points illustrated in their article—namely:

1. Though infants lose more initial weight—and, relatively, the smaller they are the greater the percentage loss of weight—the result seems to be a more virile infant.
2. Oedema (occurring in 12% of our series) disappears much more quickly.
3. Once feeding is commenced, difficulties (e.g., regurgitation or vomiting, cyanotic attacks, etc.) are more rarely encountered.
4. The nursing staff all favour a demand-initial-feed technique and soon become expert in detecting the true "hunger cry" of the newborn infant.

Very rarely have we found a rise of temperature during the initial starvation period. Nothing approximating to the textbook "inanition fever of the newborn" has been seen—not even in the series of mature infants treated by this delayed feeding technique. No infants in our series required parenteral fluid, and we are persuaded that when a raised temperature is present the aetiological factor is probably infection.

Table A is presented for comparison with Tables I and II of Gaisford and Schofield.

Table A

Weight	No.	Hour of First Feeding		Weight Loss		Percentage Weight Loss (of birth weight)
		Range	Average	Range	Average	
lb. (kg.)				oz. (g.)	oz. (g.)	
5 -5½ (2·27–2·5)	102	16 - 80	38	½–14 (14·0–397)	5½ (156)	6%
4½–5 (2·04–2·27)	78	19 -119	45	1 –12 (28·3–340)	5½ (156)	7%
4 -4½ (1·81–2·04)	55	19 -123	55	½–12 (7·0–340)	5 (142)	7%
3½–4 (1·59–1·81)	34	17½–104	60	2 –13 (56·7–368)	6½ (184)	10%
3 –3½ (1·36–1·59)	17	17½–104	64	1 –10½ (28·3–297)	6½ (184)	12%
2½–3 (1·13–1·36)	12	27 124	58	1 –11 (28·3–312)	6 (170)	14%
2 –2½ (0·91–1·13)	8	24 –104	56	2 – 7 (56·7–198)	5½ (156)	14%

The delayed or demand-initial-feeding technique has been similarly adopted for mature as well as for premature infants. It has been found to be especially advantageous in the carrying out of the "non-touch" technique treatment of those mature infants who have undergone a difficult delivery—i.e., breech delivery, difficult forceps, etc. Even the so-called normal baby has less feeding upsets on this technique. Table B shows the findings in 1,218 mature infants.

Table B

Weight	No.	Hour of First Feeding		Weight Loss		Percentage Weight Loss (of birth weight)
		Range	Average	Range	Average	
lb. (kg.)				oz. (g.)	oz. (g.)	
10+ (4·54+)	11	12 - 58	40	5–18 (142–510)	12 (340)	7%
9 -10 (4·08–4·54)	61	3½–66	33	1–16½ (28·3–482)	8 (227)	5½%
8 - 9 (3·63–4·08)	281	7 –88	29	1–17½ (28·3–496)	8 (227)	6%
7 - 8 (3·17–3·63)	467	6 –58	30	0–16 (0–454)	7 (198)	5½%
6 - 7 (2·72–3·17)	322	5 –92	35	1 13 (28·3–369)	6 (170)	5½%
5½– 6 (2·49–2·72)	76	12 –75	37	2–15½ (56·7–439)	6½ (184)	7%

In using a demand-initial-feeding technique in premature and especially in mature infants great care must be taken of the maternal breasts. Some form of expression of the breast at regular intervals must be employed (we favour three-hourly hand expression) in preparation for later feeding at the breast.

Finally, we would like to support the suggestion of Professor Gaisford and Dr. Schofield that practitioners and midwives should practise this non-feeding technique in the care of premature babies pending their transfer to hospital, so helping to lessen early inhalation asphyxia.—We are, etc.,

A. G. WATKINS.
J. JACOBS.

Welsh National School of Medicine.

Vascular Changes in Diabetes

SIR,—I should like to answer a few questions and probably raise some others in connexion with Dr. C. Shiskin's letter (June 24, p. 1490) on vascular changes in diabetes. In this I do little more than repeat the opinions expressed in the Banting Lecture (*Lancet*, September 3, 1949, p. 401), in which I mentioned the same case as Dr. Shiskin does, in which after thirty-nine years (now forty-one) of diabetes there are no vascular stigmata. His diabetes has been unusually well "controlled." Dolger may find in New York that 100% of diabetics of twenty-five years' duration have retinal haemorrhages, but I have several patients, myself included, who have escaped such initial signs of vascular involvement—and many more who have not.

The most interesting and important suggestion of Dr. Shiskin's last paragraph is that vascular degeneration is independent of diabetic control and depends on a common unknown factor which causes both "diabetes" and vascular degeneration. It is easy in this respect to postulate, as I did some years ago, some pituitary Cushing-like (A.C.T.H.) factor, but against this simple and vague explanation are two facts: (1) Retinal complications have occurred in haemochromatosis and relapsing pancreatitis, in which the disease is a straight attack on the islet of Langerhans without other endocrine involvement. (2) No diabetic, except in the mildest disturbance of carbohydrate metabolism found by some routine chemical test, has ever a normal sugar metabolism. All insulin cases show inevitably phases of hyperglycaemia, and to talk of physiological normality of blood-sugar control only displays ignorance of the real metabolic condition. Different degrees of uncontrol would be a truer description. In view of (1) and (2) we cannot rule out and must still consider years of continued and varying hyperglycaemia as a possible prime factor in these dreadful complications of retinopathy, hypertension, and renal glomerulosclerosis.—I am, etc.,

London, W.1. R. D. LAWRENCE.

Cancer of the Lung and Smoking

SIR,—With reference to your annotation on smoking and cancer of the lung (June 24, p. 1477), may I be permitted, as a non-smoker and therefore presumably uninterested in the defence of tobacco, to indicate other possibly relevant environmental changes between the years 1920 and 1947?

The first of these is, in Great Britain, the systematic surfacing of roads with tarmac and associated tar spraying. When motorcycling many years ago and when tarred roads were not so universal I was compelled to wear goggles on account of the intense conjunctival irritation caused by tar dust. Prior to the use of goggles, upon squeezing my eyes with my handkerchief I have observed my lacrimal secretion to be deeply stained by tar. If such an amount of tar dust could fall on the surface of the eye a much larger amount must have been respired. Motorists requiring demonstration of the amount of tar dust floating above a road on a dry day are asked to observe the condition of their hands after handling a steering wheel for a short time with even a portion of a window open.

Another environmental change is the increased amount of exhaust fumes, which render walking on our main roads a doubtful pleasure. In this connexion I would mention particularly the fumes of Diesel-engined heavy vehicles, and express surprise that no woman member of the public appears to have commented on these filthy exhausts.

It must be noted that I confine myself to mentioning some possibly relevant environmental changes, and that I leave any question of causal relationship to malignant disease as a matter for investigation.—I am, etc.,

Swansea. H. R. TIGHE.

Smallpox in the Unvaccinated

SIR,—In your issue of June 24 ("Points from Letters," p. 1492), Dr. H. Tudor Edmunds, after referring to the Asian seaman who initiated the recent outbreak of smallpox in Glasgow, makes the assertion, "Had this seaman not been vaccinated previously his attack of smallpox would have been recognized as soon as he was examined. . . ." He therefore opposes vaccination and the ensuing state of possibly incomplete immunity because, should an attack of smallpox supervene, the clinical picture may be so modified and atypical that the disease is not recognized and its spread thereby facilitated. He thus reiterates an argument against vaccination previously expounded many times and notably by Dr. C. Killick Millard. According to this argument it is always the atypical case modified by previous vaccination that is emphasized as a menace.

It is unfortunate for these views that Dr. Edmunds should also mention the doctor who was infected and died. This case was atypical and very difficult to diagnose. It was well that information regarding contact with the primary case soon became available, because the haematemesis at the outset of her illness did not justify a diagnosis of smallpox even to be entertained in the first instance. The exanthem did not at any time show a papular element. She had never been vaccinated.

A better example of the same type is the first case in the Glasgow outbreak of 1942. He was a seaman of pure white stock who sickened on board an inward-bound ship. On May 24 a rash appeared and the illness was diagnosed as measles by the ship surgeon. This diagnosis was confirmed by two more medical officers on board, and again confirmed by another medical officer when the ship reached the Clyde on May 29. Finally, on the patient's arrival at the hospital for admission to a measles ward the correct diagnosis was made by the physician superintendent, a man of great experience. This patient, who later died, initiated the subsequent outbreak of smallpox in Glasgow. He had never been vaccinated.

It would appear that, while smallpox may be unrecognized because it is atypical due to previous vaccination, it may also be unrecognized because it is atypical for precisely the opposite reason—viz., the patient has never been vaccinated at all.

This argument against vaccination is manifestly absurd when related, for example, to the resulting situation among the above ship's complement if all of them had been previously unprotected by vaccination. Those who died of confluent or malignant smallpox would have had the final satisfaction of knowing, although beyond mortal aid, that they had at least done everything to ensure, if one can believe it, their own early and accurate diagnosis.—I am, etc.,

Glasgow. J. S. GEMMILL.

Multiple Primary Carcinoma

SIR,—As there seems to be an interest in multiple primary carcinomata I thought that it might be interesting to report two cases, one a case with simultaneously two primary carcinomata each in an entirely different system of the body to the other, and a case of three primary carcinomata occurring consecutively and in different places.

CASE 1

The first case was a fisherman, aged 76, from Littlehampton, who in January, 1943, came to my out-patient clinic for carcinoma of the left upper eyelid. It was arranged that this growth should be treated by *x* rays. It is an old maxim that a rectal examination should be performed on every surgical patient, but in this case it seemed unnecessary. However, while awaiting *x*-ray treatment the patient was admitted as an emergency for intestinal obstruction, and it was found that he had a carcinoma of the rectum. I carried out an abdomino-perineal resection of the rectum in two stages, and his eyelid was treated by *x* rays.

The pathologist reported on a biopsy of the eyelid that the condition was a squamous epithelioma. The rectal growth was an adenocarcinoma with moderate penetration of muscle coat and a tendency to colloid production. He did very well, and in spite of wartime conditions returned to work as a fisherman and somewhat embarrassed my domestic staff by leaving at the door as a token of his gratitude a live lobster.

CASE 2

The second case is that of a woman, who is now alive and well, aged 75, and who was shown at a B.M.A. meeting recently.

In 1941 she had a panhysterectomy and salpingo-oophorectomy for adenocarcinoma of the uterus. The operation was carried out by Mr. Alan W. Douglas, who was then R.S.O. at the Royal Sussex County Hospital. In 1946 Mr. Leslie Lauste, who was acting for me, saw this patient, who was admitted as an emergency for intestinal obstruction. He found a carcinoma of the ascending colon and carried out a two-stage removal.

In 1948 I carried out a local mastectomy of the right breast for carcinoma and removal of axillary glands by means of diathermy, and she was afterwards treated by Dr. Millington with deep *x* rays. The glands were invaded by growth histologically.

All three growths were confirmed histologically, and were in entirely different systems of the body—uterus, bowel, and breast. I am indebted to Dr. L. R. Janes in each case for the histological reports.

I have not met with another case of triple primaries.—I am, etc.,

Hove, Sussex. H. J. MCCURRICH.

Popular Health Journal

SIR,—When Sir Robert Hutchison suggests the title "The Hypochondriac" for the B.M.A.'s new popular health journal he exhibits an attitude of mind which is the despair of all public health officers engaged in health education. It would not be so bad if the general public were merely ignorant of health matters, but, unfortunately, they are actively ill-informed by popular journalistic efforts and by advertisements relating to patent medicines, and our task in public health is made unnecessarily difficult because of this. We at least welcome a popular journal which will convey accurate information because it is edited under medical auspices, and, whether it is read by hypochondriacs or not, it can do nothing but good in giving real instruction to the public.

One group of readers of whom Sir Robert Hutchison seems quite unaware is formed by school-teachers and others having to do with education of children; they are avidly searching for accurate information on which to base their lessons in hygiene and applied biology.—I am, etc.,

Cambridge. CYRIL G. EASTWOOD,
Medical Officer of Health.

Ogilvie's Syndrome of False Colonic Obstruction

SIR,—In the *Journal* of October 9, 1948 (p. 671), Sir Heneage Ogilvie reported cases in which intestinal upset suggesting obstruction of the bowel followed interference with the splanchnic plexus by new growth. MacFarlane and Kay (March 12, 1949, p. 1267) reported three further cases of such pseudo-obstruction but with no pathological findings at operation. I felt that the following case, in which symptoms of interference with the physiological functioning of the alimentary tract followed destruction, partial or completed, of the splanchnic ganglia, would be of interest.

The patient, a man in his sixties, had had Von Recklinghausen's disease since his early twenties. He had multiple subcutaneous nodules and much pigmentation. For three months two nodules on his chest had begun to grow fast. For a month he had been vomiting, and for a few days before admission to hospital this vomiting had been incessant. While being examined in out-patients prior to admission he had a marked Stokes-Adams attack in which his heart block was so complete that death almost supervened. A few weeks' treatment in hospital failed to relieve his almost incessant vomiting but gave time for a biopsy of one of the enlarging lumps on the chest wall. This proved to be a secondary neoplasm of doubtful pathological origin. In view of continued vomiting a laparotomy was performed, but the stomach and colon and upper small intestines were found to be quite normal. At the back of the upper abdomen round the crura of the diaphragm and extending upwards and into the diaphragm on both sides was a large irregular mass, obviously of new growth.

The growths on the chest were of course secondaries from the growth in the abdomen, and in view of the Stokes-Adams attack, suggesting cardiac involvement, Dr. Harold Avery (who had seen the patient) and myself both felt that they may have been due to direct extension of the growth, involving to some degree the heart itself.

The interesting fact is that this patient had such persistent and uncontrollable vomiting without any demonstrable lesion or obstruction either to the oesophagus, stomach, or bowel generally. This was demonstrated not only radiographically but operatively. The vomiting seemed to be due to involvement of the nerve supply of the stomach from the splanchnic plexuses. It is interesting to note that since operation, and without any different treatment, the vomiting has since been much less marked and the patient's life more comfortable and endurable.—I am, etc.,

London, W.1. A. J. HOBSON.

The Medical Bill

SIR,—Mr. P. C. L. Diggory's letter (*Journal*, June 24, p. 1492) is welcome evidence that the British Medical Students Association, over which he presides, is alive to certain defects in the Bill as it stands, among them the one to which my own letter drew your attention—i.e., the injustice of enforcing an onerous new condition, to wit twelve months' compulsory resident medical service *after qualification but before registration*, against medical students who signed on, and have since done years of their training, on the old basis. This injustice, which was not mentioned in the House of Lords debates, Mr. Diggory's association would remedy by deferring the appointed day "until after the expected date of qualification of those who have already commenced their studies." A simpler and at the same time more effective remedy would, I suggest, be by way of a proviso exempting from the new condition those who were bona fide medical students when the Bill was presented to Parliament or passed into law. I don't like the word "expected."

It seems to me important also to stress the fact (mentioned by Lord Llewellin in the debate) that until 1939, 50% of qualified students went into general practice immediately upon registration, including (as the Goodenough report says) "some well-qualified students who on account of their own or their families' financial circumstances felt unable to take advantage of the benefits offered by postgraduate experience in hospitals." This fact is a useful measure of the hardship which the new restriction may inflict upon many students. Unless something is done now the large class of students who hitherto for one reason or another have not been able to manage as free agents and as doctors even six months in a hospital job will in future be forced to do an extra twelve months' (or more) resident service as students or "interns" (another ominous word!). This criterion is in no way weakened by the further fact that during the war 94% of newly qualified doctors took hospital jobs immediately after registration; because, of course, this increase was obviously due to purely wartime measures such as (*a*) compulsory national service, and (*b*) compulsory direction of doctors of military age into civil hospital appointments.

Two other points made in the Lords also need comment. Lord Llewellin, by way of support for the new restriction, "recalled that both in the case of barristers and solicitors part of the preliminary training was spent in practical work under an experienced lawyer." This statement conveys a very wrong impression. A Bar student is entitled (*a*) immediately upon qualification to be called to the Bar, and (*b*) immediately upon call to practise anywhere; and no barrister is required as a condition precedent to qualification or call or practice to undergo any sort of practical training. Many of them do in fact learn some of the ropes, either before or after call, in the chambers of a busy practitioner—I did so myself, after call and concurrently with practice on my own account; but none is obliged to. It is hard indeed to imagine the Inns of Court—those ancient champions of law and justice—trying, as this Bill apparently seeks to do in the case of medicine, to enforce an onerous unilateral change in the conditions upon which they accepted their students. As to the would-be solicitor, he spends the whole period of his training (five years or less, according to circumstances) as an articled clerk in the office of a private practitioner.

Secondly, Lord Horder limited his commendation of the proposed new condition to the ground that a doctor newly registered under the present conditions goes out into practice "ill fitted in respect of responsibility and judgment"—i.e., lacking

a sense of responsibility. This may possibly be true of some of the youngest of them, though I should have thought that daily experience, during their long years of clinical training, of disease and death must surely by the end of their course have sobered the least responsible among even them. But how can it be true of the fine ex-Service types, with their war experience and their training in responsibility, of the many men with wives and families, and of the 30+, 40+, 50+, and occasionally even 60 + ancients who together form a considerable proportion of the total number of medical students? Are all these irresponsible too? If not, why should they all be treated as if they were?—I am, etc.,

Guildford. W. B. MANLEY.

Scarlet Fever, Rheumatic Fever, and Acute Nephritis

SIR,—Dr. T. W. Buchan (May 27, p. 1268) asks for information on the average duration of fatal cases of scarlet fever, rheumatic fever, and acute nephritis. From study of a short series of thirty fatal cases of acute nephritis occurring between the years 1939 and 1946 in the R.A.F. and W.A.A.F. it appears that the mean duration was 47 days, the median figure being 36 days. The cases were distributed as follows:

Duration of case in days	1–9	10–19	20–29	30–39	40–49	50–59	60–69	70–79	80–89	90–99	More than 100
Number of cases	2	6	5	5	0	1	3	3	0	3	2

Six deaths occurred in October, five in March, four in January, three in May and August, two in June and July, and one in February, April, September, November, and December. I can give no information about the duration of fatal cases of scarlet fever or acute rheumatism as the numbers of deaths from these causes in the R.A.F. and W.A.A.F. were even fewer than those from acute nephritis.

I am indebted to the Director-General, Medical Services, Royal Air Force, for permission to publish these figures.

—I am, etc.,

Stanmore, Middlesex. C. G. BURGESS, Wing Commander.

Acute Tubular Necrosis

SIR,—In the discussion at a meeting of the Section of Experimental Medicine of the Royal Society of Medicine on acute tubular necrosis Professor J. H. Dible, according to your report (May 27, p. 1262), stated that the lesion affected the whole nephron; that there was cellular necrosis of the tubules; that the cast material in the early stages in the secondary convoluted tubule was hyaline and not pigmented; and that the ascending limb and secondary convoluted tubule were especially affected, although the whole of Henle's loop showed the lesion. Granular material was present in the glomerular space. It is clear from Professor Dible's statements that the mechanical blockage by blood products is not the aetiological factor, as it was absent at the early stages in all cases, and at all stages in a proportion of cases.

Dr. E. M. Darmady went further in stating that, in view of Professor Jean Oliver's experiments, tubular blockage by pigment casts could no longer be regarded as responsible for this type of renal lesion. In certain cases, he said, nervously intermediated renal vasoconstriction remained a possible explanation, but in others it appeared to be excluded, and one had to consider other mechanisms—e.g., Professor Selye's alarm syndrome might be concerned. But he gave no details about the Johns Hopkins experiment on which he based his opposition to a common neurogenic aetiology: for example, he did not state at what level the cord was transected, nor what functional tests were applied to ascertain that all the renal nerves had in fact been divided. So I personally cannot regard this evidence as excluding the possibility suggested by the experiments of Trueta *et al.* in 1947.

With regard to Dr. G. M. Bull's dismissal of the "Oxford shunt" as a possible factor, I should in the first place like to know what he implies by the term in question, for it was invented abroad and is as yet very variously interpreted. Secondly, though acute nervous diversion of the renal cortical blood flow may be associated with low degrees of desaturation of the reduced total renal blood flow, I am unaware of any experimental evidence of the degree of desaturation associated with a diversion lasting long enough to produce inactivity of the tubular cells such as was found by Dr. Bull in his patients.

Dr. Hingson, by his method of continuous caudal analgesia, which appears to abolish afferent glomerular arteriolar spasm, has dealt successfully with the clinical state of anuria in various fields, and his results are dramatic. Professor Oliver, from the evidence provided by his dissection of nephrons, has attempted to show a distinction between damage caused by primary ischaemia and by toxin producing a renal shut-down. Dr. Hingson's therapeusis logically covers the former group in its entirety. It should encroach on the latter at the stage when the ischaemic protective mechanism is no longer serving a purpose and is in fact inimical to recovery.—I am, etc.,

London, W.1. JOHN SOPHIAN.

Intestinal Obstruction Due to Food

SIR,—The article by Mr. Neil Ward-McQuaid (May 13, p. 1106) and the letters which have followed show that many cases of this condition have been recorded and that future interest may well settle upon the foods which form rare causes. I therefore think that one of my two cases at least is worth mentioning. So far it seems to be the only case resulting from the "pickled onion."

Case 1.—A lady aged 52 was admitted to hospital on November 16, 1949. She had had abdominal colic for several days which had been severe for twenty-four hours. She had been vomiting since November 11. On November 15 she had passed a watery stool but there had been no flatus since then. On examination she was dehydrated and distended. She was tender to the left of a subumbilical scar of an incision for a hysterectomy in 1946. There was vigorous audible peristalsis. Laparotomy through a right paramedian incision showed a firm lump in the lumen of the ileum about 6 in. (15.24 cm.) above the ileocaecal valve. There was gross distension of the gut above the obstructing mass, which on removal was found to be a large pickled onion. Her convalescence was uneventful. Inquiry showed that she had eaten this onion about ten days previously at a party.

Case 2.—A lady aged 59 was admitted to hospital on January 8, 1946, with pain which had commenced on January 6. She had been vomiting since her last bowel action on January 6. She had a distended resistant abdomen and acute bronchitis. Exploration showed that her acute intestinal obstruction was due to orange pith. The only special interest in this case lies in the fact that she had hurriedly eaten an orange which was part of her grandchild's ration.

I am forced to wonder to what extent these cases are caused by hurried eating and failure to masticate food adequately.—I am, etc.,

Northampton. A. R. BANHAM.

SIR,—The article on "Intestinal Obstruction due to Food" by Mr. Neil Ward-McQuaid (May 13, p. 1106) recalled my meeting with a case in 1947. The obstructing material, grapefruit, was finally vomited.

The patient was a woman of about 50 and of moderate physique who had been seized with spasms of violent, diffuse abdominal pain of colicky type some three-quarters of an hour before, followed by vomiting. When I saw her she was pale and shaken; a spasm of abdominal pain came on within a few minutes. She went pale, sweated, and her pulse slowed. She drew her knees up and was tense, and any physical movements made were an attempt to curl herself up in a ball. About five minutes later the pains eased and she vomited some bile-stained fluid. In the interval before the next bout of pain the temperature and pulse were normal; there was no abdominal rigidity; something appeared to be palpable in the anatomical location of the pylorus, and it seemed to harden and soften; tenderness was present to the left of the mid-line slightly below this level.

She was advised that she should be removed to hospital or a surgeon should see her. She refused these suggestions but agreed to going into hospital next morning if no better. Obstruction due to some food eaten and lodged at the duodeno-jejunal flexure was considered at this stage.

Since the lady remained obdurate about seeing a surgeon, it was decided to see if the effect of posture and gravity would achieve anything; two to three bouts of pain had occurred in the meantime. Accordingly her head was lowered and pelvis elevated by manipulating pillows, and she was turned on her right side inclined towards the bed. The next access of pain, her last, was followed by the vomiting up of nearly a half of a grapefruit "eaten" the same day. It had been incompletely divided with a knife into four or five pieces, as is usual before serving it at a meal.

It was as surprising that she had managed to bolt such a large piece of food as it was gratifying that the simple manœuvre had been successful. She was up and about as usual next day.—I am, etc.,

Reading, Berks. GEORGE A. JACKSON.

Morphine in Status Asthmaticus

SIR,—I was particularly glad to read Dr. Clement Francis's letter of June 17 (p. 1429) because I deplore the attempt to completely ban the use of morphine or its derivatives in this condition. This is a time-honoured remedy, and it would appear to me that deaths from asthma and bronchial asthma have become more frequent since the introduction of modern adrenaline therapy with the exclusion of morphine and atropine.

I entirely agree with Dr. Francis that other therapy should be given at first, and whenever possible I give an expectorant mixture, with ephedrine or "neo-epinine," get the patient well propped up in bed, warm, and with plenty of fresh air, and obtain oxygen if possible.

If I am called at night to a patient in a bad attack, I endeavour to assess the condition of the heart and lungs and inquire what drugs have already been taken, and I usually start by giving an injection of one of the pituitary-and-adrenaline preparations or adrenaline alone, and nikethamide sometimes seems helpful. After watching the patient I then decide the dose of morphine or "omnopon" that is safe to inject, and this varies from ¼ gr. to ½ gr. (8 to 16 mg.), always with atropine 1/100 gr. (0.65 mg.).

I am convinced that I have saved lives by this method, and shall be sorry if young doctors become afraid of its judicious use, and doubt if there is any new treatment at present that will adequately replace it.—I am, etc.,

London, W.14. C. WATNEY ROE.

Mission to Lepers

SIR,—The Mission to Lepers was founded in 1874 as an international and interdenominational society in order to enable Protestant missions to undertake work for those suffering from leprosy—and from its social consequences—by giving financial support and general guidance. Since then it has grown into a great society with extensive work in many lands. In the past it has not been the policy of the Mission to send out its own doctors and nurses. This was not necessary so long as the co-operating societies were able to provide the personnel. But to-day they are unable to do so in sufficient numbers. And this is just at a time when the prospects of curing leprosy have been brought nearer by the introduction of sulphone treatment. This has led the council of the Mission to decide that the time has come to send out itself a certain number of doctors, nurses, and other medical workers.

There are vacancies at present in India and China for a few men doctors and women nurses. Those who may consider offering themselves should be young, and wholly sympathetic to Christian missions. They should be prepared themselves to serve as medical missionaries and to co-operate wholeheartedly with missions and churches in the countries to which they go. The field of work offers no financial prizes; ordinary medical missionary allowances will be given; but the work does afford a fine field for Christian doctors eager to give themselves to a difficult task at a time of great opportunity. Those who wish to apply should be under 30 years of age and should send, along with details of qualifications and experience, references from those who know their character and capabilities.—I am, etc.,

7, Bloomsbury Square, London, W.C.1. A. DONALD MILLER, General Secretary.

Obituary

S. ERNEST DORE, M.D., F.R.C.P.

Dr. S. E. Dore, who died on June 27 at the age of 77, was until his retirement a few years ago one of the most prominent dermatologists in London.

Samuel Ernest Dore was educated at Mill Hill School and St. John's College, Cambridge. He studied medicine at St. Mary's Hospital, and there he came under the influence of Sir Malcolm Morris, whom he assisted in the skin department until Morris's retirement, afterwards continuing to help him in private practice. After leaving St. Mary's Dore became assistant to Dr. Pringle at the Middlesex Hospital, and on the retirement of Dr. Colcott Fox he was appointed physician to the skin department at the Westminster Hospital. Later he was also physician to the skin department at St. Thomas's Hospital, holding the two posts together until he reached the age for retirement. He also held similar appointments at the Hampstead General and the Evelina Hospitals, and in 1924 accepted an invitation to join the reconstituted staff of St. John's Hospital for Skin Diseases.

Dore proceeded M.D. in 1906 and took the M.R.C.P. a year later, being elected F.R.C.P. in 1920. He was a corresponding member of the French Dermatological Society, and assistant editor of the *British Journal of Dermatology and Syphilis* from 1916 to 1918. During the greater part of that period he was in charge of the journal because of the editor's absence on war service. He was a very active member of the dermatological section of the Royal Society of Medicine, exhibiting many cases and taking a very active part in the discussions. He was honorary secretary of the section in 1914–15 and president in 1930–1. He also attended regularly meetings of the British Association of Dermatology and Syphilology, and was honorary secretary from 1930 to 1932 and president in 1933. He was president of the St. John's Hospital Dermatological Society from 1928 to 1930. Apart from all these activities Dr. Dore was a vice-president of the Section of Dermatology at the Annual Meetings of the B.M.A. in 1921 and 1932, and president of the section at the 1936 Meeting.

While working with Morris, Dore's interests were particularly directed to the uses of radiotherapy in the treatment of skin diseases. With Morris he wrote a book entitled *Light and X-ray Treatment of Skin Diseases,* and he also translated Wickham and Degrais's work on radium therapy. He was undoubtedly one of the pioneers of the use of radium in the treatment of rodent ulcer in this country. He contributed many papers on dermatological subjects to different journals, the most notable being one on the contractibility and nervous supply of the capillaries and one on a chronic mild localized type of acrodermatitis perstans, which is by some associated with his name. In 1941 he delivered the Malcolm Morris Memorial Lecture on advances in dermatology during the past forty years.

Dore was a man of retiring disposition, with an immense knowledge of his subject. He was always accessible to his colleagues, who made full use of his wisdom and mature judgment. His extremely equable temperament made him beloved by his colleagues and pupils. He married late in life, and leaves a widow to whom the sympathy of everyone who knew him will be extended.—A. G.

R. M. B. MacK. writes: While others who have more knowledge of the details of his life must write their appreciation of his career, it is perhaps fitting that one of his

pupils should attempt to pay tribute to the memory of Dr. S. E. Dore. If one was asked to name the characteristics for which he was most beloved one would say for his equanimity and kindliness; if asked to answer a question concerning his ability one would say that it was in diagnosis and in knowledge of the writings of the French school that he excelled. Many in our profession seem always to be pursued by time, but Dore, although he accomplished as much work as most of his contemporaries, seemed always to be unhurried. His work was characterized by accuracy, urbanity, and friendliness; often the monotony of routine was relieved by a flicker of humour. His ability was often underestimated because he made no effort to impress his students; it followed that his work was appreciated more by postgraduate students than by undergraduates. It was characteristic that during the nineteen-twenties one of his colleagues should have remarked, "I have often been surprised to find that if there is anything new that is remotely connected with dermatology it is usually being tried out in Dore's department quite a while before the rest of us have even heard of it." In recent years it has been pleasant occasionally to see one's old master, apparently but little aged by the passing of the years; but as in his active days time had never succeeded in fretting him, it was natural that as he grew older he should have been but little changed. One had hoped, until recently, that he would continue to enjoy the tranquillity of his later years. That hope has been broken, but those of his pupils who continue in the practice of his specialty can but be grateful for the benisons of friendship, tutelage, and encouragement which for many years they received from him.

"R. O." writes: Dr. Dore's out-patient department at St. Thomas's had an atmosphere of its own, stamped with the characteristics of the man himself. It was kindly, genial, and unhurried. There was a guarded optimism and friendliness affecting patients, nurses, students, and staff—and without this one gets nowhere in medicine. The dermatological mysteries were expounded with skill, but with a diffident charm; and such searching questions as the one about the difference between eczema and dermatitis were dealt with to enduring satisfaction. The lurking acarus curled infallibly round the point of the pin, and the microscope—rather an ancient one—showed up the secrets of the fungus scraping. No session went by without some humorous touch, for this was in Dore's make-up, and he drew on a long experience.

Dr. Thompson Barron writes: After an association with Dr. Dore extending over 25 years it is difficult to do justice to his memory. We became close and intimate friends, having much in common apart from professional affairs. His was a charming personality, but he was of such a retiring nature that comparatively few got to know him intimately. He was always ready to do a good turn and to assist others in any way in his power. I mourn him with feelings of great personal loss. He was one of my dearest friends.

J. F. WARD, M.D., F.R.C.P.

Dr. John Forbes Ward, who died on June 29 after a short illness, was educated at the Stockport Grammar School and Manchester University, graduating M.B., Ch.B. in 1909. He then held a number of house appointments, including that of resident medical officer at the Manchester Royal Infirmary. At this time, too, he travelled in the United States and Europe. During the 1914–18 war he served with the R.A.M.C. in Gallipoli, Egypt, Sinai, France, and Belgium. Returning to this country he took the M.R.C.P. in 1919; and in 1920, when he proceeded M.D., he became visiting physician to the Royal Manchester Children's Hospital at Pendlebury and to St. Mary's Hospital for Women and Children. From then on Ward devoted all his time and energy to the care of children, becoming well known as a paediatrician in Manchester and in Lancashire generally. He had a wide medical knowledge, and a degree of understanding and kindness which impressed not only his young patients but also their parents. He was appointed University lecturer in the diseases of children at St. Mary's Hospital, and both here, at Pendlebury, and on the many committees on which he served his opinions, always honest, were often sought by his colleagues. He was elected F.R.C.P. in 1938.

An original member of the British Paediatric Association, Dr. Ward always looked forward to the annual meetings, especially those held at Windermere, as he knew and loved the Lake District and especially its bird-life and flora. Modest and retiring by nature, his friendship, once won, was enduring and firm, and he was a splendid companion at meetings such as these. Among other appointments Ward held was that of visiting physician to the Ethel Hedley Hospital for Crippled Children at Windermere, and in spite of the distance from his home he was a regular visitor there. At the outbreak of the 1939–45 war he rejoined the Forces. He served as lieutenant-colonel both at home and abroad, and he was not demobilized until 1945.

Ward was an expert numismatist and had a valuable and interesting collection of coins, but his chief delight was his beautiful garden, where he and his wife worked in their spare time. Never a "clubman," Ward spent a lot of his time during off-duty hours browsing in old bookshops in search of volumes to add to his large library. He was much loved and will be much missed, but he will always be remembered for his great qualities of high principle and integrity. He is survived by his widow and two daughters, to whom the deepest sympathy of his friends and colleagues will be extended.—H. T. A.

Dr. JAMES LYONS died suddenly on June 1 at his home in Lincoln at the age of 61. Born in Omagh, County Tyrone, he received his medical training at Queen's University, Belfast, and graduated M.B., B.Ch., B.A.O. in 1912. After holding resident appointments in Belfast, he was later house-surgeon at the Rotherham Hospital and senior house-surgeon at the Lincoln County Hospital. During the 1914–18 war he served in France as a captain in the R.A.M.C. and was medical officer to a cavalry regiment. Soon after demobilization James Lyons proceeded M.D. He went on to take the Dublin D.P.H. and the F.R.C.S.Ed. in 1920 and the M.Ch. of Belfast a year later. After a time spent as medical superintendent of the Bucknall Hospital, Stoke-on-Trent, he settled in Lincoln in 1923. Combining surgery with general practice, he was appointed surgeon to the Burton Road Hospital and subsequently consultant to Lincoln Corporation, Lincoln City Maternity Home, and Bracebridge Heath Hospital. In 1934 Dr. Lyons became police surgeon for Lincoln, and in 1947 he retired from general practice and thereafter specialized in obstetrics and gynaecology. A keen member of the B.M.A., he rarely missed attending a meeting, and he was chairman of the Lincoln Division in 1934–5 and president of the Lincolnshire Branch in 1938–9. During the 1939–45 war he undertook the onerous duties of honorary secretary to the local medical war committee and earned the gratitude of all his colleagues. James Lyons was one of the kindest of men and never spared himself in his patients' interests. In addition he had a most generous nature, and this, combined with marked professional ability, made him popular alike with patients and with his colleagues.

He leaves a widow and two daughters, to whom the sympathy of many friends will be extended in their sudden bereavement. —G. A. B. W.

Dr. BETHIA MUIR NEWLANDS, a senior assistant medical officer in Middlesbrough, died in Aberdeen on June 2. She received her medical education at the University of Aberdeen, where she graduated M.B., Ch.B. in 1919, going on to take the D.P.H. in 1925. Dr. Newlands held resident appointments at the Royal Victoria Infirmary, Newcastle-upon-Tyne, and in the children's hospitals of Nottingham and Bradford. After working in the Aberdeen public health department, she was appointed a school medical inspector, in 1928, by the West Riding County Council, where she remained for 14 years. In the last two years of her service there she was senior administrative medical officer. During the 1939–45 war she held the post of acting medical officer of health for Brighouse, and in 1946 she became senior assistant medical officer for Middlesbrough County Borough.

J. C. writes: Although Dr. Newlands was of a retiring disposition, her breadth of vision and eye for detail made her an excellent organizer. Right to the end of her working life, despite the handicap of mortal illness, she showed untiring zeal and was endlessly painstaking in the performance of her duties —to an extent that compelled the admiration even of those who are tempted, in moments of weakness, to act on Talleyrand's cynical admonition in the matter. Her monument is the vastly expanded maternity and child-welfare section of the health service in Middlesbrough.

Dr. KENNETH MCALPINE died on June 11 after a brief illness. A student of Glasgow University, he graduated M.B., Ch.B. in 1917. He had a brief period of service in the R.A.M.C. before starting on his career in the school medical service at Birmingham and at Stoke-on-Trent. He went to Leicester in 1924 as assistant school medical officer, and since then as an officer of the education authority he had given loyal and devoted service until his final illness just over a month ago. He became senior school medical officer in 1946, when he had to handle the many difficult problems of the immediate post-war years.

A. J. S. writes: Dr. McAlpine was an able and efficient administrator in a highly important public capacity, dealing with the health and well-being of the child population of Leicester. To many thousands of people in the city as well as to his intimate friends he was much more than that. His nice sense of punctilio in administrative affairs could never mask the kindly, generous nature of the man himself. His professional experience among children must have been unique; his personal dealings with each one of them, young and old, was of a texture not found in books, but stemmed from his deep love of children and his own innate charm. To those of us who worked with him and under his supervision, clerical staffs, nurses, professional colleagues, Dr. McAlpine will be remembered with sincere and lasting affection. To all who sought his advice at any time, he was an immediate guide, counsellor, and friend. But beyond those there must be thousands in Leicester who, meeting him as children and now grown up, would wish to pay generous tribute to a fine doctor and a most lovable personality.

The Hungarian Government has recently decreed the terms of service of Civil Servants and doctors and others working in the health services. According to the Hungarian News and Information Service the decree lays down a working week of 48 hours—8½ hours a day for five days, and at least four hours on Saturday. Except on Saturdays employees are entitled to a 30-minute break a day for meals, which is counted and paid for as part of the working hours. After six months' service employees are allowed six working days' holiday with pay a year. This is increased by one day's holiday for each month's work up to one year. For each succeeding year of employment the annual holiday is increased by one day to 25 working days.

Medical Notes in Parliament

MEDICAL BILL

Second Reading

The Minister of Health, Mr. ANEURIN BEVAN, moved the second reading of the Medical Bill in the House of Commons on June 27. In the House of Lords the Bill was given a second reading on April 18 (*Journal*, April 29, p. 1011), and had been subsequently amended in committee (May 13, p. 1146) and on the report stage (May 27, p. 1275).

Mr. Bevan said the Bill did not undertake a complete revision of the medical Acts—which would be a major task, involving prolonged study and possibly evoking a great deal of controversy—but only set out to provide for a number of matters of urgent public importance, and for a few less important matters in which some early change in existing arrangements was obviously desirable. From discussion with representatives of the medical profession, and from the welcome given to the Bill in the House of Lords, the Government believed it would command general support.

Of the four main purposes of the Bill, the first was to improve the standard of medical education. In this the Bill gave effect to the main recommendations requiring legislation contained in the report of the Goodenough Committee issued in 1944. It provided in Clauses 1 to 6 that from a day to be appointed every medical student after passing his final examination, but before admission to the *Medical Register*, was to be required to serve satisfactorily for a prescribed period in one or more approved hospitals and institutions. An amendment in the House of Lords made it clear that the institutions should include, subject to certain safeguards, approved health centres. The intention was that this period of "intern" service should normally be one year, but by an amendment made in the House of Lords the period was left to be fixed by the General Medical Council, subject to the approval of the Privy Council, without any specified minimum. This would facilitate any modifications which might be necessary in the event of an emergency, and there was also just the possibility that at the outset there might be difficulty in enforcing a full year's service.

It would obviously be some time before a day could be appointed for giving effect to the requirement of intern service. It was necessary, for example, to ensure that there were sufficient house appointments or other suitable posts before the requirement could be imposed, and there were also accommodation problems. Further, some period of notice would have to be given to existing students. It was possible that some parts of the British Isles might be ready for the introduction of the compulsory intern service before others, and the Bill made it possible for it to be introduced piecemeal in different parts of the country if that should ultimately be considered desirable. He mentioned that the G.M.C. still exercised some jurisdiction in relation to the Republic of Ireland, and said that complete agreement had been reached between the two countries on the arrangements outlined in the Bill.

The G.M.C. had reciprocal arrangements with other countries, and provision was made that newly qualified doctors from these countries who applied here for registration should show that they had served an intern period or otherwise acquired equally extensive experience. This provision, too, it might be necessary to apply at different times to different countries; New South Wales and the Union of South Africa were already prepared for its introduction, but other countries were not, and time for consultation and adjustment would have to be given.

There was a further provision for the visitation of medical schools. The Bill empowered the G.M.C. to appoint visitors to places where medical students were taught. This again was in accordance with the views of the Goodenough Committee. Hitherto the Council had only been able to appoint visitors and inspectors of examinations, to report on the sufficiency or otherwise of examinations, but the standard of professional practice obviously depended more on the teaching given in the medical schools than on any control that could be exercised by visiting and inspecting the examinations. The general

standard in the schools would have a profound effect on whether or not the intern period would be advantageous. Accordingly, the powers of the G.M.C. were being widened to enable them to visit the actual places where the medical students were taught, and to report on the training actually given.

There was power to give directions to the G.M.C. in connexion with the arrangements for visitation, and this was to be exercised by the Privy Council. He emphasized that the Government had been careful at all times to ensure that any influence over the academic side of medicine should be exercised by authorities like the Privy Council and the General Medical Council, and not directly by the Government. Here, as in the National Health Service Act, he had been particularly scrupulous to see that there was no governmental interference with academic medicine. The G.M.C. and the university authorities should have no difficulty in making arrangements so that there should be some agreement about these inspections. This particular provision required no long advance administrative arrangements, and should come into operation almost immediately.

The second purpose of the Bill was to alter the constitution of the General Medical Council. Its numbers were to be increased from 39 to 47; the number of Crown members was to be increased from five to eight, the number elected by the medical profession from seven to eleven, and the number appointed by the universities, medical corporations, and royal colleges (27) would be increased by the addition of a representative of the Royal College of Gynaecologists and Obstetricians.

The third part of the Bill was the improvement in the disciplinary machinery and procedure of the G.M.C. It was proposed by Clause 14 to entrust decisions on professional discipline to a new medical disciplinary committee of the Council which would have 19 members, including the President of the Council, at least six elected members, and at least two laymen. It was now provided, as a result of an amendment in the House of Lords, that cases should normally be dealt with not by the full committee of 19, which was rather large, but by between five and nine of the members, including at least one layman. The President would, however, be entitled to arrange for the full committee to deal with a particular case if he thought the circumstances warranted it.

Provision was made for evidence to be taken on oath and for witnesses to be subpoenaed. There was no similar power at present, and as a result it had often been impossible to secure the attendance of necessary witnesses. This change in law was exceedingly important from the point of view of the doctors. A doctor whose name was erased from the *Register* was given a right of appeal to the Judicial Committee of the Privy Council either on law or on fact, or against sentence. These were exceedingly important improvements on the existing situation. There was also provision for rules to be made both for the procedure of the disciplinary committee—rules made by the committee and subject to the Privy Council's approval—and about the functions which the legal assessors to the Council would exercise. All these changes would come into operation on a day to be appointed; this was necessary because the rules to be made would require careful consideration and discussion with the interests involved.

The fourth provision of the Bill was to increase the fees payable for registration. The present maximum which the G.M.C. could charge was £5, originally fixed in 1858. The functions of the G.M.C., carried on without imposing any charge on public funds, had obviously much increased, and the income from registration—the main source—and other sources had become quite insufficient to enable the Council to pay its way. The Bill provided for a maximum fee of 11 guineas for full registration, including five guineas for provisional registration when that was operative. There was power from the Privy Council to vary the maxima by order. The provision for increased fees would take effect on the passing of the Act.

G.M.C. and B.M.A.

Mr. WALTER ELLIOT said the proposed alterations in medical education were more important than all the other purposes of the Bill, because they would affect every graduate. The second, third, and fourth purposes—the machinery purposes—were unexceptionable. He hoped that consideration of the Bill would help to dispel the popular superstition that the General Medical Council was in some way or other the same thing as the British Medical Association, and that tremendous disciplinary powers were given to what was after all a trade union. The G.M.C. was in no way a trade union, as could be seen from the large number of persons appointed to it from outside.

They would all welcome the increase in the disciplinary powers of the G.M.C., because miscarriages of justice had taken place in the past owing to the lack of those powers. They were all glad, too, that a right of appeal had been given, although he thought the question would have to be examined further in committee whether the appeal direct to the Judicial Committee of the Privy Council in preference to the High Court was the right solution. He did not think that the danger which the Minister had mentioned, of different standards arising if appeals were made to the separate High Courts in the United Kingdom, was very great.

In the improvement of medical education the important step had been taken of recommending that an additional year should take its place in the medical curriculum. The danger was that the curriculum might be unduly prolonged, that the final period might be projected further and further away until it came to a time in a man's life when he could no longer take full advantage of it. The curriculum was already overloaded. The masses of information which the medical student had to acquire, and which were appropriate in other days, were not appropriate to-day. Medical education should constantly be remodelled to suit the necessities of the time, to avoid subjects piling up on each other instead of substitutions taking place.

He yielded to no one in his admiration of the training which the great hospitals gave to the young graduates, but responsibility was never felt when all the resources of a great hospital were around one as it was when starting to grapple with the multifarious emergencies of private practice with one's own hands and knowledge. It was said that a new set of posts would have to be created to give greater responsibility to the housemen. These posts would be difficult to get, and appropriate responsibility would be difficult to devolve upon them. This extra year would need to be looked at with very great care, to make sure that a sense of responsibility was really developed and that it was not merely used as a further occasion for learning. The Opposition welcomed the Bill and would do their best to give it an easy passage.

L.S.A. and T.U.C.

Dr. H. B. MORGAN strongly opposed the Bill. The first of the three chief functions of the G.M.C., he said, was the supervision of the *British Pharmacopoeia*. That was the one function which had been done very well. The second function was medical education—and that was very bad. There should be a one-portal system of entering the profession, on one fixed standard, so that everybody who came into the profession should pass a qualifying examination and be recognized throughout the world as being of a certain standard. Instead of that there were different standards. Too high a tribute could not be paid to the great university schools, but there were also undemocratic bodies of no great concern to the public but only to themselves. He mentioned the London Society of Apothecaries, and in reply to a question by Surgeon Lieutenant Commander R. F. B. BENNETT said that the standard of medical education and of the knowledge asked for was too low for qualification. There should be one governing professional qualifying examination, with an examiner—not examiners from the schools—to see that every man had a fair deal. Many organizations like the Colleges took no responsibility for training but were purely examining bodies, sometimes claiming revenue from those they deliberately flouted.

The Trades Union Congress wanted the subject of industrial diseases taught in the medical schools. It had asked the G.M.C. to include this subject of the relationship between occupation and health in the ordinary curriculum. The medical schools had done nothing. Only in Glasgow, Manchester, Durham, and Newcastle-upon-Tyne was there an organized course of lectures. One specialist in London, Dr. Donald Hunter, was doing

excellent work in the London Hospital, but the other schools did not bother about it at all.

Working-class parents had to make a great sacrifice for six years to get their son through the medical school. Now it was proposed to add another year. There were not sufficient institutions to keep all the doctors that would come out. Suppose a man did not want to go into general or even consulting practice but wanted to be a specialist or to go in for medical literature, to become, perhaps, Editor of the *British Medical Journal*. Suppose he wanted to go into medical research, or tropical medicine. Must he waste another year on a subject in which he was not interested?

This Bill was a rotten Bill. It was a Conservative Bill. Extended registration would hurt the working-boy. The composition of the G.M.C. should be such that it should include no nominee, or very few in comparison with the elected members. It should be a purely professional body. He was ashamed to say that the Government had not yet approached the T.U.C. for its views on a matter of such importance to industrial workers—medical education and conditions. The Bill should be taken back and reconsidered.

A Minimum Standard

Dr. CHARLES HILL said that in his argument for the common portal of entry Dr. Morgan had ignored the fact that the role of the G.M.C. was to secure a minimum standard and leave the licensing bodies to apply a standard in excess of that if they chose. On the question of industrial medicine in the curriculum, Dr. Morgan should apply himself to that part of the Bill which strengthened the power of the General Medical Council in visiting medical schools, and so enabling the G.M.C. to exercise a stronger influence over those schools. On the third point, he hoped it was not right to assume that, as a result of this new and important arrangement under which there was first qualification and then registration, this was merely a year added to the curriculum. If that assumption was right the full purpose of this Bill in relation to medical education would not be served. He welcomed as a most important change this arrangement under which, towards the end of a student's career, when examinations were out of the way, a man or woman was enabled to assume a post of some responsibility under supervision.

He hoped the Bill would lead to a re-examination of medical education, and to the elimination of some unnecessary parts. He hoped too that the new posts to be created for internship would be designed for the purpose, and in relation to the function they had to fulfil in medical education, and not be house appointments as they now knew them multiplied for the purposes of the additional year. They would get the full fruits of this important new development only if that year was related to a revised medical curriculum, and if special posts with the right kind of responsibility were created for the purpose.

In regard to the disciplinary provisions of the Bill, he was glad that discipline was going to be a matter not for the Council as a whole but for a committee specially established for the purpose; that would lead the Council to think more and more about medical education, and save them having so much of their time taken up with disciplinary work. He did not like the arrangement whereby any person involved in the original sorting out and assessment of cases might also be a member of the disciplinary committee.

The answer to Dr. Morgan's point about the use of the extra year to a man who was going to be a medical journalist, or an expert on tropical diseases, was that the man might subsequently decide to enter practice, and if he had not done this extra year, which was a part of the curriculum, not something grafted on to it, there would be two standards in operation. He welcomed the Bill as making a substantial qualitative contribution to medical education.

Mrs. JEAN MANN suggested that the Bill should be amended to let the year of provisional registration be served not only in hospital but under an experienced general practitioner. Otherwise the extra period as a houseman in her view would be just a waste of time and of no help to the general practitioners who were now overworked.

Mr. RICHARD FORT asked what were the chances of there being room in the hospitals for all the house appointments envisaged first by the Goodenough Report and now by the Bill. Would it be possible to administer the extra year's planning so that the interns would be able to have the 20 or 30 beds in conformity with the Goodenough recommendations? There was also the question of free board and lodging for the interns. Would provision be made for that, and if so what sums of money were likely to be involved? Could anything be said now about the rates of remuneration? They should know whether they were talking about an improvement in medical education which would take place within the next two years or so, or whether they were looking forward to something which would only take place within the next decade.

Revision of the Curriculum

Dr. A. D. D. BROUGHTON welcomed the Bill as seeking to raise the standards of medical efficiency and conduct. That part of it which related to the G.M.C. and its disciplinary committee he saw as designed to maintain a high standard of ethics. On that part which affected medical education, he pointed out that now that all intern postgraduate appointments carried remuneration the financial obstacle had been removed from the path leading to greater proficiency, and a period of service for every doctor would raise the standard of subsequent professional work. The argument that it was sought to add another year to the course of medical training was only correct in so far as it affected a minority of students. The majority of newly qualified men and women, in their desire to gain useful experience, already undertook postgraduate duties in hospitals.

Supporting the contention that there was a need for close examination of the medical curriculum, he said he wished that the Government had gone further in the Bill, because the system of medical education required review, revision, and reform. In this connexion he hoped that it could be revised soon in such a manner as to allow the schoolboy to learn more about the arts, and possibly the classics, before going to a university to embark on years of intensive scientific study. That would provide the doctor with wider knowledge, and make him still more capable of carrying the heavy burden of responsibility when he entered practice.

Surgeon Lieutenant-Commander R. F. B. BENNETT agreed that a good deal of lopping in the curriculum was possible, and mentioned in particular the extremely minute knowledge of anatomy and his studies of botany and zoology. He asked if the inspection of medical schools by the G.M.C. would mean that those schools within a university which could already be inspected by their own university and the University Grants Committee were to be liable to three forms of inspection.

He referred, on the proposed disciplinary provisions, to the selection of the crime of adultery as the one type of civil case in which the G.M.C. disciplinary committee should not have the power to call further evidence before pronouncing judgment on an erring doctor. He understood that criminal charges could be regarded as proved on conviction, and action taken accordingly by the disciplinary committee. But adultery was a civil offence. Why, when that was found proved, should that alone be selected as the one civil offence on which no further evidence could be offered to the G.M.C. before a decision was reached? Finally he referred to the increased registration fee, remarking that it was a little hard on the student of all people to have to pay more, and asking if the fee could not be eased.

Practical Training

Mr. SOMERVILLE HASTINGS said that although the Bill did not go as far as he would have liked, he welcomed it because it made the education of British doctors, already the most practical in the world, even more practical. The trouble to-day was that there was too sharp a division between the time when as a medical student the young doctor had few responsibilities and never had to make decisions, and the time when he suddenly became qualified and found that the life or death of his patients depended on his diagnosis and treatment. The Bill was good in that its proposals would make this transition more gradual, but careful thought would be needed on how the principles of the

Bill were to be carried out. He could not see that there were enough suitable appointments for interns to go round. There would be difficulties in deciding whether a young doctor's work was "satisfactory," and there was also the case of the physically handicapped person. A man who had lost all or part of his hand could not be an efficient house-surgeon, or take an appointment as an obstetrician, yet the Bill said that he had to serve part of his time in one of these capacities.

They were told that service in a health centre would do as well as service in a hospital, and he was glad of it, but at present the health centres did not exist. Moreover, while he agreed that to help an efficient doctor in a health centre would be most valuable training for a general practitioner, he thought that service in a special department in a health centre should only count as training for a specialist.

He was disappointed about the constitution of the G.M.C., in that only 11 of its 47 members were to be elected by the profession. The General Nursing Council had 34 members, of whom 17 were elected by the profession. On disciplinary procedure, he would like to see some less penalty than that of being struck off the *Register*. According to the Bill a doctor struck off could not apply for replacement for eleven months, and in that time any doctor's practice would have gone to pieces.

Dr. BARNET STROSS, questioning the denigration of the Bill by Dr. Morgan because it did not contain power to compel every medical school to set up a chair in industrial medicine, said every school would readily and gladly do so—and set up a chair in social medicine too—if they had the money available.

There were some questions to be answered when the Bill was in committee. For example, what was meant by the word "satisfactory" as used in connexion with the year's extra work? Further, if a person was crippled during training, or fell ill—possibly with infantile paralysis—was he to be denied the opportunity of further work or of service with approved institutions? How long would they have to wait, and if there were no immediate opportunities for entry, how long would it be before they could register?

On the penal side there were also certain changes which it was hoped to bring about in committee. They must separate the judicial from the executive functions of the Council, and be certain that no one who had been concerned with a preliminary investigation should sit later on the disciplinary committee itself. He hoped to see also that no action in future was taken against a medical man unless a formal and written complaint was sent in and could be supported by whoever had made it.

Undue Specialization

Mr. H. H. LINSTEAD said he thought someone might have seized the opportunity to pay a tribute to the G.M.C. for the work they had done in the educational and disciplinary fields over a long period of years, and in conditions of some difficulty. He had attended sessions of the G.M.C., sitting in its disciplinary capacity, and he had been amazed at the way in which an extremely clumsy machine managed to function with what certainly appeared to an onlooker to be efficiency and justice. It was not the quality of the Council which was at fault, but the difficulty of appeal which tended perhaps to give it a bad name.

Overloading and undue specialization was something from which every profession suffered. There was no simple answer. They could not cut out of the curriculum of a scientific profession any substantial amount of its basic science. As science advanced the medical practitioner must keep pace with it. If there was to be found any answer it must be partly, he thought, in the direction of the qualified practitioner relying upon specialists in other branches in professions allied to medicine for a great deal of the technical work which at present he did himself. The radiographer and the physiotherapist, for example, must have responsibility on their shoulders. Moreover, in the teaching of sciences more attention must be paid to making them part of a liberal education.

Some consideration would have to be given to the conditions in which health centres were to be approved for the year's training. Only one of the dozen centres in existence was fit for the training of general practitioners. The disciplinary machine must be examined more closely. No member of the G.M.C. should at the same time be a member of the penal cases and disciplinary committees. The penal cases committee must not assume to itself part of the function of the disciplinary committee. If the finding of the High Court in the one case involving adultery in a matrimonial cause was to be accepted as binding on the Council, they must examine carefully why a similar state of affairs was not to apply to other cases.

He welcomed the introduction for the first time in this type of legislation of the Judicial Committee of the Privy Council. Most professions valued their association with the Privy Council, and if they could gradually substitute the Judicial Committee for the High Court as the court of appeal for professional tribunals they might find that they had introduced a useful innovation in the legal system. Finally he pointed out supervision of the *British Pharmacopoeia* was one of its functions which the G.M.C. did not carry out. With the passage of years they had ceased to be the appropriate body for this work, and had handed the duty over to the Pharmacopoeia Commission, composed of one or two doctors but mainly of chemists and pharmacists.

Government Reply

Miss MARGARET HERBISON, Joint Under-Secretary of State for Scotland, replying to the debate, said there had been much criticism of the overloading of the curriculum in the medical schools and she felt that the debate, in which so many had spoken from full knowledge of the subject, might bear some fruit. She hoped there would be an examination of the curriculum.

She agreed that the teaching of industrial medicine was of the greatest importance. The Trades Union Congress considered that insufficient time was given to it, but Dr. Morgan was less than fair when he suggested that in our medical schools and universities almost nothing was being done in that field of medicine. In the Glasgow, Manchester, and Newcastle universities the courses in industrial medicine had been financed by the Nuffield Foundation. There were one or more lecturers in the subject in Birmingham, Bristol, Edinburgh, London, and Sheffield. The Government was satisfied that the correct way of getting this or any other subject into the curriculum was not by vesting power of direction in the General Medical Council. That would be found objectionable not only by the medical profession but also by the public.

To deal with the duplication of examinations the Government hoped to arrange that there would, in effect, be only one set of examiners. One great improvement in the Bill lay in providing that visitors not merely examined an examination but really examined what was being taught in the medical schools. In that way they hoped that the General Medical Council would be able by persuasion, not by force, to make those changes in the curriculum which public opinion seemed to think necessary.

When a doctor was provisionally on the *Register* he would be able to sign a death certificate. It had been asked why there had been selected in the Bill one case where the disciplinary committee could not re-examine evidence. It would create great difficulties if this were not so. On the other hand, it might be that after examination the Government might decide that other cases ought to be put in the same category. This one was chosen because it was the one that in the past had often come before the General Medical Council.

The suggestion that this intern period might be spent in general practice as a trainee assistant was completely contrary to the findings of the Goodenough Report. It would be contrary also to the views expressed by the General Medical Council. The Government felt that the best experience could be got in hospitals and similar institutions, and if they were to yield to this new suggestion there would be great difficulty in supervising the course properly. It would be better to wait and find out how the provisions of the Bill worked before making any extension for experience in general practice.

Some fear had been expressed that those who served on the penal services committee would be serving also on the disciplinary committee. What had been found out in other fields did not bear out the contention that this would be wrong. There was nothing in other fields to justify the contention that a man's judgment would be prejudiced if he tried in the first instance

to find whether there was a prima facie case for inquiry. This was the procedure in the case of solicitors, and there was another instance among the justices of the peace in England, who, after they had committed a man for trial at quarter sessions, could, and often did, sit at the quarter sessions. It could not be contended that they had been prejudiced, but it was a point worth discussion in committee.

Although there had been questions about the supply of posts for intern training, the Government intended to leave the period of twelve months in the Bill, but they could not say at this stage how soon they could make it work. In Scotland there might be more difficulty than in England and Wales, for one-third of the doctors produced in the whole of Britain were trained there. They had come to the conclusion that it would not be possible to provide a great number of places in Scotland, and that perhaps England would provide the beds for these other doctors who were trained in Scotland. A doctor qualifying in Ireland who wanted to get on to the *Register* must from the appointed day do intern service there in the same way as doctors qualifying here.

The motion for the second reading was agreed to.

Cost of Drugs in N.H.S.

Colonel ROPNER asked the Minister of Health on June 29 why, without effective consultation with their Central Committee or awaiting the findings of the Whitley Committee which was inquiring into the matter, he had imposed on chemist contractors under the National Health Scheme a cut from 33% to 16% in the on-cost allowance on drugs supplied by them on prescription.

Mr. BEVAN in reply said that he was determined that all unnecessary expenditure on the National Health Service should be eliminated, and after consultation with the chemists' representatives in accordance with the regulations he was satisfied that there were grounds for an immediate provisional reduction in this allowance. Negotiations were proceeding, however, and he had undertaken to accept whatever final percentage might be agreed by the Whitley Council or awarded by an arbitrator.

Mr. E. L. MALLALIEU asked the Minister of Health whether, having regard to the fact that many doctors prescribed expensive proprietary preparations for which cheaper non-proprietary preparations of equal therapeutic value might be substituted, he would consult the British Medical Association as to the best way of bringing the matter to the notice of both doctors and chemists, with a view to saving expenditure without in any way impairing the service to the patient.

Mr. BEVAN said he had been in consultation with the British Medical Association about the action to be taken on the Report of the Joint Committee of the Central and Scottish Health Services Councils, which had been considering prescribing under the National Health Service. The report was to be published, and would be available on July 1. Copies were being sent to all doctors, both general practitioners and hospital medical staffs, taking part in the National Health Service, with a covering letter asking for their help in avoiding unnecessarily expensive prescribing. The question of other action on the report was under consideration.

The report to which Mr. Bevan referred is summarized at page 24 of this week's *Supplement*.

Midwives' Uniform

The terms of the Midwives (Amendment) Bill in relation to the wearing of the proposed national uniform for midwives were finally determined when the Bill was considered on Report in the House of Commons on June 28.

Clause 6, which authorizes the rules to be made on this matter, was amended in the following terms:

"(3) Any agreement made (whether before or after the passing of this Act) between a local health authority or other body or association and a midwife employed by them for the purpose of attending on women in their homes as a midwife or maternity nurse shall be void in so far as it precludes the midwife from wearing a uniform prescribed by virtue of subsection (1) of this section."

Mr. A. BLENKINSOP, Parliamentary Secretary to the Ministry of Health, moving this amendment, recalled that in the earlier debates, although the Government felt that the balance of advantage might be in allowing the local authority to decide the matter for themselves, in view of the strong feelings fairly generally expressed that there should clearly be full opportunity for the midwives to wear the new national uniform that was being approved, he promised to put down an amendment to clarify the intention of that made in the House of Lords. The amendment he now moved made it clear that the midwife would have the full right to wear the new national uniform if she so desired, even though there might be an agreement with the local authority about some locally designed uniform. This arrangement was limited to domiciliary midwives. There had been some criticism of this amendment from the local authorities. If in some localities there was in use a local distinctive uniform, he was sure that the midwives in the area would be content and happy to continue to wear it, but should a midwife desire to wear the new nationally designed uniform she would now have full power to do so.

Dr. A. D. D. BROUGHTON supported the amendment on the ground that there should be a national uniform for midwives, and that they should have the right to wear it if they so desired. Dr. BARNET STROSS put some questions at the request of his local authority. Would the amendment confer on midwives the right to wear the prescribed uniform irrespective of the wishes of the local authority; would it mean that this was a departure from the principle that all matters concerning conditions of service should pass through the appropriate Whitley Council, as in the past; and would not a new, anomaly be created with respect to other members of local authority staffs, such as the domiciliary nursing service, which would be wearing a uniform prescribed by the local health authority whereas there would be a uniform for midwives prescribed by the national authority?

Miss HORSBRUGH said the choice was now left to the midwife as to the uniform she would wear, and she welcomed the amendment. Mr. W. Ross suggested that they were falling into error through this modern curse of uniformity in pressing for a national uniform instead of taking into account regional considerations.

Mr. BLENKINSOP said they were allowing a wide freedom, and in a case like that of Glasgow, where a uniform was universally respected and was specifically worn, midwives would naturally desire to continue to wear it. He was sure that local authorities on consideration would be able to secure a satisfactory working of this arrangement, and that where there was a satisfactory local uniform in use already the midwife would desire to continue to wear it.

The amendment was agreed to, and the Bill was afterwards read a third time.

Medico-Legal

CLAIM AGAINST DOCTORS FAILS

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

A man of 59 with a long history of mental ill-health sustained a fracture of the neck of the left femur while undergoing electric convulsion therapy at Barnsley Hall Mental Hospital, Gloucester, on May 20, 1947. He made no complaint at the time. Next day his wife telephoned to the hospital, and the resident surgeon advised her to call in the family doctor. She accordingly sent for Dr. George F. Henderson, of Headless Cross, near Redditch, who did not find the fracture. On June 10 the patient, William Dawe, returned to the hospital, and Dr. Andrew Shepherd, the medical superintendent, and Dr. John P. McGuinness, the resident surgeon, pressed him to become an in-patient and have a full examination, but he refused. He was then limping and using a stick, but was not assisted. On June 19 he became an in-patient, and on examination the fracture was discovered. He subsequently sued the three doctors, and Dr. Elizabeth Eleanor Henderson, the wife of Dr. George Henderson, for damages for alleged negligence, stating that as a result of the failure of the mental hospital doctors to diagnose the fracture until June 19, and

of the two Drs. Henderson to diagnose it at all, his left leg had been shortened by 1¼ inches (3.75 cm.) and had suffered limitation of movement.

At the trial before Mr. Justice Hallett at Worcestershire Assizes at the end of January,[1] the patient's wife gave evidence that she was now living apart from him and that for many years before 1947 he had been full of complaints and had made many absolutely unfounded accusations against her. When Dr. George Henderson had seen him on May 21 the doctor had said that the matter would be better in the hands of the people at Barnsley Hall, but the patient had flatly refused to go there. Dr. George Henderson said in evidence that when he saw the patient on May 21 he was walking in a downstairs room but complained of pain in his left leg. The doctor had regarded his complaints as unreliable: he had been complaining for seven years and in addition was in a confused and hysterical condition. He had examined him honestly and carefully and had noticed that there was a limitation of movement of the leg, but no obvious shortening or abnormal position. Dr. Shepherd testified that an impacted fracture might be missed by a general practitioner after such a treatment. Dr. McGuinness did not agree that he could have discovered the fracture on June 10. An examination had not been possible then because Dawe had refused to become an in-patient.

Judgment

The learned judge stressed that the evidence of the patient was quite unreliable. Electric convulsion therapy was beneficial in certain mental disorders, but involved a degree of risk. The patient had been free to refuse to re-enter hospital, and after this advice of the doctors had been refused it seemed a very strong proposition to suggest that they were guilty of negligence because they did not then suggest a second, third, and fourth best course in the hope that the patient would accept one of them. He gave judgment for the doctors with costs.

[1] *Birmingham Post*. January 27 and 28, 1950.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

FINAL M.B.—*Part I (Surgery, Midwifery, and Gynaecology):* T. D. Anderson, W. D. Anderson, V. Armett, A. M. Baker, J. A. C. Bamford, A. P. Barclay, J. H. F. Batstone, J. F. Bennett, J. W. Bradbeer, E. J. F. Brewer, G. S. Brindley, J. M. Brown, P. B. Brown, M. J. Clarke-Williams, R. A. Cooper, J. C. M. Currie, N. L. Dallas, J. M. H. Dickson, J. W. Draper, H. B. Eckstein, M. L. E. Espir, R. M. F. Fox, M. Gibbs, J. N. Gibson, P. H. Gorodi, I. M. Guiver, A. T. G. Gunn, U. M. P. Hill, R. P. Holmes, M. L. House, P. E. Huddy, H. F. Juckes, Mrs. M. E. Kendrew, C. D. Lacey, K. Last, Mrs. J. Lodwick, J. S. McCormick, J. J. McMullan, J. W. E. Mark, R. D. Montgomery, J. K. Perkins, F. S. Perry, H. F. W. Pribram, M. G. Rinsler, I. H. Robinson, H. M. Roseveare, K. E. K. Rowson, T. B. Scott, S. E. Sebag-Montefiore, J. A. J. Smith, P. G. I. Stovin, P. R. V. Tomson, P. H. Wheeler, K. G. Williams, V. G. Wills. *Part II (Principles and Practice of Physic, Pathology, and Pharmacology):* C. A. M. Aitken, J. B. Berry, M. D. Billington, M. Binnie, M. H. S. Bound, D. R. Bowsher, H. H. Broadhead, J. M. Brown, P. B. Brown, A. A. F. Bryson, D. Butcher, J. S. W. Chambers, A. C. Chovil, E. M. D. Craig, J. E. Dalby, J. W. B. Dalgleish, T. D. W. Davies, H. de Glanville, H. B. Eckstein, I. D. Edeleanu, M. L. E. Espir, A. D. Fuller, P. R. Gittins, J. R. Gough, K. W. Gray, K. E. Halnan, G. Harvey Evers, G. E. Heald, J. M. Heaton, J. M. Hodson, G. Holden, R. P. Holmes, J. F. Hort, T. M. Howell, P. G. A. Irvine, J. D. Jackson, E. W. Jones, H. F. Juckes, Mrs. M. E. Kendrew, F. E. Kirk, K. Last, J. F. Lees, C. R. Leeson, T. S. Leeson, D. W. Lemmon, Mrs. J. Lodwick, J. S. McCormick, E. Marley, H. M. Michaelson, J. L. Milligan, R. D. Montgomery, B. J. Muir, A. D. Muirhead, M. J. D. Newman, D. S. H. W. Nicol, A. O'Brien, R. H. Oram, A. B. L. Peake, R. F. Pearson, M. J. Peel, G. N. St. J. Penney, J. K. Perkins, S. T. Pickles, R. B. Prowse, D. R. Pugh, J. N. Redfern, F. Reiseger, A. M. Richardson, M. G. Rinsler, J. M. G. Ritchie, D. W. T. Roberts, C. R. Robinson, J. H. Ross, H. B. Russell, S. E. Sebag-Montefiore, J. B. Spargo, P. C. Steel, P. G. I. Stovin, J. D. E. Strong, D. R. Sweetnam, Mrs. E. R. Taylor, R. Thomas, P. R. V. Tomson, A. C. Townsend, S. E. Trickey, A. G. Wallace, W. J. Wigfield, J. P. Williams, P. L. Williams, P. O. Williams, V. G. Wills.

UNIVERSITY OF ST. ANDREWS

The following degrees have been conferred:

M.D.—C. R. Baxter, J. M. Gilmore, K. G. Lowe (with honours and a Rutherford gold medal), E. J. Michie, Marjorie S. Milln, D. S. Macphail, J. H. Prain (with commendation and a Rutherford silver medal), *D. H. Smith.

CH.M.—A. A. Douglas (with honours).

The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—Mary R. Kerr (with distinction), *J. N. Gale, *Ruth Y. Golder, *Marjorie M. Kinnear, *Marion C. Miller, D. Allan, G. C. Azie, J. Bartholomew, F. Bell, Veronica M. Bowman, Edith M. B. Bryant, Marjorie F. Carnan, J. D. Carr, Helen M. Crockatt, A. A. Duncan, E. E. Ecoma, Antonia Firnberg, H. Fyfe, Jean O. Gerrard, D. B. Gibb, Anne L. M. Graham, A. B. Grant, P. H. Harley, R. G. Hendry, B. O. Igwebe, Elinor K. Johnston, M. Kirstein, Elizabeth F. Laird, A. J. Lawson, Irene Leeser, R. L. MacDonald, J. D. Macgregor, A. R. Mackenzie, J. M. McKenzie, Muriel J. Martin, I. M. Mennie, Margaret G. Millar, H. R. Milne, I. G. Murray, P. W. O'Brien, W. L. Ogilvy, D. B. L. Rankine, H. C. Renney, Marie Renwick, Madeline M. Russell, J. H. F. Silver, T. Sonnenschein, D. C. C. Stark, J. K. Steel, S. A. Stephen, B. R. D. Suttie, Pauline F. Taylor, M. G. Wagg, Jane M. Wallace.

*With commendation.

UNIVERSITY OF EDINBURGH

The following Macarthur Postgraduate Lectures will be given at the Anatomy Lecture Theatre, University New Buildings, Edinburgh: Thursday, July 13, 5 p.m., "Experimental Studies on the Eye Based upon the Regeneration of the Neural Retina and the Lens" (to be illustrated by coloured films), by Professor L. S. Stone, M.D., Bronson Professor of Comparative Anatomy, Yale University School of Medicine; Tuesday, July 18, 5 p.m., "Benjamin Rush, M.D.: His Edinburgh Student Days and What Came of Them," by Dr. George W. Corner, Director of the Department of Embryology, Carnegie Institution of Washington, Baltimore, U.S.A. Senior students and graduates in medicine are invited to attend the lectures.

UNIVERSITY OF WALES

The Council of the Welsh National School of Medicine has appointed Harold Scarborough, Ph.D., M.B., Ch.B., F.R.C.P.Ed., Professor of Medicine and Director of the Medical Unit at the School. Dr. Scarborough is at present Reader in Medicine in the University of Birmingham.

The following candidates for the degrees of M.B., B.Ch. at the Welsh National School of Medicine have satisfied the examiners at the examination indicated:

PATHOLOGY AND BACTERIOLOGY.—A. S. Bater, Joyce M. Bennett, Vyvien J. Bennett, J. W. Bough, D. R. Boyns, P. Callaghan, J. S. Campbell, G. W. Clark, R. L. Coppock, Bronwen N. Davies, D. B. S. Davies, Barbara C. Edwards, J. C. Evans, Marjorie J. S. Evans, J. N. Glanville, A. M. S. Hansrod, P. I. Harry, W. E. J. Horton, A. P. Jones, D. J. Jones, Nesta Lewis, Rachel B. J. Lewis, Mary I. Lloyd, J. E. Merrell, Janet M. Moffat, I. B. Morgan, J. H. Naysmith, E. J. Phillips (with distinction), R. P. Phillips, D. H. Richards, Joyce M. Smith, Glenna Thomas, G. Williams, W. Williams.

OBSTETRICS AND GYNAECOLOGY.—Ilid M. L. Davies, Dilwyn T. Jones, T. M. Morgan, S. J. S. Polwin, J. W. Rees, Esther H. Thomas.

UNIVERSITY OF BIRMINGHAM

On July 1 the honorary degree of D.Sc. was conferred on Dr. Herbert M. Evans, director of the Institute of Experimental Biology, University of California, and on Dr Leonard Colebrook, F.R.S., director of the Burns Unit at the Birmingham Accident Hospital from 1944 to 1948. The honorary degree of D.Litt. was conferred on Mr. Stanley Morison, typographical adviser to the Cambridge University Press.

UNIVERSITY OF LEEDS

W. J. O'Connor, M.D., has been appointed Senior Lecturer in Physiology, and T. K. Marshall, M.B., Ch.B., Lecturer in Forensic Medicine.

No. 24

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended June 17.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	39	4	19	—	—	28	4	14	3	1
Deaths		—	—				—	—		
Diphtheria	51	2	14	1	1	81	4	26	3	3
Deaths	—	—	—	—	1	1	—	—	—	—
Dysentery	351	17	143	1	—	53	2	51	1	1
Deaths					—				—	—
Encephalitis, acute	8	3	—		—	3	1	2	—	—
Deaths		—		—			—			
Erysipelas			19	8	1			30	3	6
Deaths							—			
Infective enteritis or diarrhoea under 2 years				19					21	
Deaths	10		3	1	1	26	4	—	2	1
Measles*	8,857	529	835	266	119	9,249	801	576	217	159
Deaths†		—	1	—	—			1	—	—
Ophthalmia neonatorum	40	5	10		—	45	4	5	2	—
Deaths										
Paratyphoid fever	9	—	—	1(B)	—	24	1	3(B)	—	—
Deaths	—		—		—	1	—	—	—	—
Pneumonia, influenzal	431	25	7	—	10	416	30	10	6	9
Deaths (from influenza)‡	6	1	—	1	—	8	1	—	—	—
Pneumonia, primary			138	¶				159	16	
Deaths	130	21		5	7	147	26		6	5
Poliomyelitis, acute	93	9	17	4	15	19	2	—	—	—
Deaths§	2	—		—		4	1			
Puerperal fever		—	2				—	13		
Deaths										
Puerperal pyrexia‖	85	9	2	—	1	96	11	14	1	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	850	72	120	59	54	1,090	82	180	63	44
Deaths†			—	—	—				1	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	6	—	1	4	5	9	2	—	1	—
Deaths	1	1	—		1	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,649	199	380	73	43	1,806	102	128	76	63
Deaths	4	1	—	—	—	8	—	1	2	—
Deaths (0–1 year)	221	30	29	14	5	246	32	26	16	6
Deaths (excluding still-births)	4,138	653	491	143	106	4,276	653	573	164	100
Annual death rate (per 1,000 persons living)			9·9					11·5	10·2	
Live births	7,761	1225	979	431	270	7,326	1218	982	420	269
Annual rate per 1,000 persons living			19·7					19·7	26·0	
Stillbirths	187	22	28			192	36	26		
Rate per 1,000 total births (including stillborn)			28					26		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Smallpox on s.s. Strathnaver

A Goanese seaman was landed from s.s. *Strathnaver* at Aden on June 19 believed to be suffering from chicken-pox. The diagnosis was later confirmed as modified smallpox. Passengers and crew were vaccinated during the voyage. The vessel arrived in the port of London on the morning of July 2. There was no case of sickness on board on arrival. Some 1,200 passengers and crew disembarked and were placed under surveillance until July 5 in the areas to which they travelled.

Practitioners are advised by the Ministry of Health to consider a diagnosis of smallpox if a person who travelled on this vessel falls sick. Revaccination may cause extreme modification of the clinical illness and of the exanthem.

Poliomyelitis

Notifications during the week ended June 24 were: paralytic cases 104 (77), non-paralytic cases 38 (16). Figures for the previous week are shown in parentheses. Although this is a substantial increase, the high prevalence still seems to be chiefly confined to a relatively limited area of the Midlands. There were 45 notifications in Warwickshire (41 in Birmingham C.B.), 9 in Staffordshire, and 14 in Worcestershire. Thus the epidemiological picture differs from that in the corresponding weeks of 1947 and 1949.

Discussion of Table

In *England and Wales* there were decreases in the notifications of measles 1,855, acute pneumonia 49, and diphtheria 22. There were rises in the incidence of whooping-cough 212 and poliomyelitis 14.

The largest falls in the incidence of measles were Warwickshire 214, Durham 147, Middlesex 147, Kent 145, Cheshire 138, Lincolnshire 113, Northumberland 104, and Shropshire 95. The largest exceptions to the general decline were rises in Gloucestershire 69 and Hertfordshire 62.

The local trends of scarlet fever remained almost unaltered. The largest rises in the notifications of whooping-cough were Gloucestershire 57, Lancashire 41, and Essex 39; the largest falls were Yorkshire West Riding 44 and Durham 30. The fall in the incidence of diphtheria was mainly due to two counties, Durham and Kent, with 10 and 8 fewer cases, respectively, than in the preceding week.

The incidence of dysentery was maintained at a high level. The chief centres of infection were: Lancashire 119 (Oldham C.B. 33, Chadderton U.D. 17, Preston C.B. 16, Crompton U.D. 14, Manchester C.B. 8, Burnley C.B. 8, Liverpool C.B. 7, Lees U.D. 7); Yorkshire West Riding 81 (Sheffield C.B. 24, Spenborough U.D. 21, Leeds C.B. 8, Bradford C.B. 8); Durham 43 (Stanley U.D. 19, South Shields C.B. 8, Gateshead C.B. 6); London 17 (Southwark 6); Staffordshire 15 (Walsall C.B. 12); Northumberland 15 (Newcastle-upon-Tyne C.B. 14); and Yorkshire East Riding 14 (Kingston-upon-Hull C.B. 14).

Notifications of acute poliomyelitis in Birmingham C.B. rose from 20 to 28; the other large centres of infection were Lancashire, Liverpool C.B. 4; Staffordshire, Rugely U.D. 4; and London, Stepney 3, Woolwich 3.

In *Scotland* there were decreases in the notifications of measles 125, acute primary pneumonia 32, and scarlet fever 20. There were rises in the incidence of whooping-cough 22, acute poliomyelitis 9, and dysentery 9. The largest returns for dysentery were Glasgow 78, Midlothian county 23, and Edinburgh 13. Areas with more than one notification of acute poliomyelitis were Glasgow 8, Renfrew county 3, and Fife county 2. All the cases of diphtheria were notified in the western area.

In *Eire* decreases were recorded in the notifications of whooping-cough 62 and measles 25. The decline in the incidence of whooping-cough was general throughout the country.

In Dublin C.B. notifications of measles increased by 22 in contrast to the general fall.

In *Northern Ireland* the trends of infectious diseases showed only slight variations from those of the preceding week.

Week Ending June 24

Notifications of infectious diseases in England and Wales during the week included: scarlet fever 973, whooping-cough 3,746, diphtheria 39, acute pneumonia 344, measles 9,086, acute poliomyelitis 142, dysentery 213, paratyphoid fever 9, typhoid fever 13.

Quarterly Returns for Northern Ireland

The quarterly report for the third quarter of 1949 shows that the birth rate was 21.2 per 1,000. The infant mortality was 43 per 1,000 registered births, and was 2 more than in the preceding third quarter. The general death rate was 9.5 per 1,000 and was 0.5 below the average of the five preceding third quarters. Of the 84 deaths from the principal epidemic diseases, 58 were attributed to diarrhoea and enteritis and 14 to whooping-cough.

Medical News

Honorary Physicians to the King

The following have been appointed Honorary Physicians to the King for a period of three years as from July 1: Dr. Samuel Barron, M.R.C.P.I., Medical Officer of Health, City of Belfast; Dr. Walter Eric Chiesman, F.R.C.P., Medical Adviser to H.M. Treasury; Dr. Sydney Walter Fisher, Principal Medical Inspector, Mines Department, Ministry of Fuel and Power; Dr. Arthur Massey, C.B.E., Chief Medical Officer, Ministry of National Insurance; Dr. Robert Hughes Parry, F.R.C.P., Medical Officer of Health, City of Bristol, and Professor of Preventive Medicine, University of Bristol; and Dr. Harry James Rae, *M.C.*, Medical Officer of Health, City of Aberdeen and Counties of Aberdeen and Kincardine. The following have now completed their term of office as Honorary Physicians to the King: Dr. James Boyd, F.R.C.P.I., Sir William Allen Daley, M.D., F.R.C.P., Dr. A. M. Fraser, Sir Walter Haward, O.B.E., M.B., B.S., Sir William Wilson Jameson, G.B.E., K.C.B., M.D., F.R.C.P., F.R.C.O.G., and Dr. Norman Tattersall.

Relief of Widows and Orphans

The annual general meeting of the Society for Relief of Widows and Orphans of Medical Men was held on June 7, with Mr. Hope-Gunning, vice-president, in the chair. Seven members were elected to the court of directors, and Mr. G. T. Mullally was elected a vice-president. The report and financial statement for 1949 were adopted. At the end of the year the membership of the society was 244. During the year 43 widows were in receipt of grants, and the total sum distributed was £4,311 10s. The by-law relating to the income limit of widows enabling them to receive grants has been raised from £125 to £150 per annum. The meeting concluded with votes of thanks to the chairman and to the president of the society, Sir Robert Young, for his services during the past year. Further details about membership of the society may be obtained on application to the Secretary, 11, Chandos Street, London, W.1.

Immunization Stopped in Birmingham

Owing to the rising incidence of poliomyelitis in Birmingham, schemes for immunization against diphtheria have been temporarily stopped there on the advice of the Ministry of Health. The relation between recent inoculation and paralytic poliomyelitis was discussed in a leading article in this *Journal* on July 1 (p. 28).

The Royal Society of Medicine

At the annual meeting of Fellows of the Royal Society of Medicine on Tuesday, the gold medal of the society was presented to Professor E. D. Adrian, O.M., M.D., F.R.S. Sir Henry Dale, in making the presentation, said the medal was awarded triennially, and this was the eleventh occasion on which it had been presented. He spoke of the outstanding contribution which Professor Adrian's researches had made to medicine. The diploma of Honorary Fellowship was presented to Professor Alfred Gigon, M.D. (Basle). There were four other recipients of the diploma, who were prevented for various reasons from attending. These were Professor Gosta Forssell, M.D. (Stockholm), Professor Alberto Houssay, M.D. (Buenos Aires), Professor Abdul Mooro Pasha (Cairo), and Professor Wilder Penfield, C.M.G., M.D., F.R.S. (McGill University, Montreal). The scrolls, said Sir Henry Dale, would be transmitted to them, except in the case of Professor Mooro, who was expected to be in England shortly, when an occasion would be taken to present it to him in person. The report of the council of the society, which was presented at the meeting, stated that there were now on the roll of membership 9,714 names (9,203 of them being Fellows), an increase of 325 on the year. Lord Webb-Johnson was unanimously elected to the presidency of the society.

Medical Insurance Agency

The annual meeting of the Medical Insurance Agency was held on June 23 at B.M.A. House. The report of the committee of management for 1949 disclosed a record amount of service to the profession, a record total of rebates of premium granted to clients, and a record profit available for medical charities. New covenants were entered upon with the Royal Medical Benevolent Fund, the Royal Medical Foundation of Epsom College, and the Benevolent Fund of the British Dental Association. Re-elected to the committee were Dr. Charles Hill, Dame Barrie Lambert, Professor J. W. McNee, Dr. Henry Robinson, Sir Arnold Stott, and Dr. E. R. C. Walker; Mr. R. L. Newell was also elected. Dr. James Fenton was re-elected chairman and Dr. Henry Robinson honorary secretary. The total of life insurance negotiated by the agency and completed with various companies was about £2,976,000; it was reported that in 1950 this figure might be exceeded. The chairman paid tribute to the work of the general manager, Mr. A. N. Dixon, and his staff, and to the honorary secretary. The establishment of branches at Cardiff and Birmingham is being considered, in addition to those already existing at Edinburgh, Leeds, Manchester, and Dublin.

Wills

Professor Thomas Porter McMurray, C.B.E., Emeritus Professor of Orthopaedic Surgery, Liverpool University, President-elect of the B.M.A. for 1950–1, left £92,215. Dr. Henry Walker, of Louth, Lincs, left £11,047; Dr. Thomas Mulvany, of Muswell Hill, £7,801; Dr. William Edmond, formerly of Shrewsbury, £17,275; Dr. Walter Lazarus-Barlow, formerly of Smithy Hall, West Mersea, late Professor of Experimental Pathology at London University and Director of the Cancer Research Laboratories, Middlesex Hospital, £5,782; Major-General Andrew Gibbs, formerly honorary physician to King George V, £12,668; Dr. John Gordon-Munn, formerly of Heigham Hall, Norwich, who had been Lord Mayor of Norwich, £64,970; Dr. Gordon Lane, O.B.E., of Eastbourne, £15,447; Dr. Lilias Emily Frazer-Nash, of Kingston Hill, Surrey, one of the first women doctors to qualify in medicine in this country, £15,254; Mr. Norman Patterson, of Ashridge Park, Berkhamsted, late surgeon, Throat Hospital, Golden Square, W., £17,856; Lieutenant-Colonel Charles Deyns, J.P., of Bletchley, £50,176; Dr. Thomas McKiernan, of Falmouth, £22,792; and Dr. William Branson, C.B.E., of Bury St. Edmunds, for some years on the consulting staff of the Royal Free Hospital, £38,419. Dr. Thomas Glynn-Morris, of Liverpool, left £22,703; Dr. Charles Evans Jenkins, of Sale, Cheshire, £10,218; Dr. William Caldwell Steele, late of Walthamstow, £17,494; and Dr. James Arthur Unitt, of Quorn, £50,020.

COMING EVENTS

The Osler Club

The annual dinner of the Osler Club will be held at the South Kensington Hotel, Queen's Gate Terrace, London, S.W.7, on July 12, at 7.45 p.m. The guest of honour will be Sir Henry Souttar, who will deliver the Oslerian Oration. The charge is 15s., and members are invited to bring other members of the medical profession interested in the club and its work. Dress: lounge suits. Those wishing to attend should write to the secretary, Dr. M. J. Linnett, 70, Shooters Hill Road, Blackheath, London, S.E.3.

Industrial Radiology

The summer meeting of the Industrial Radiology Group of the Institute of Physics will be held at the New Horticultural Hall, Victoria, London, S.W.1, from Tuesday, July 25, to Friday, July 28. Admission to the lectures and Group summer exhibition (and to the technical exhibition of the International Congress of Radiology) will be by ticket only, obtainable free from the Institute of Physics, 47, Belgrave Square, London, S.W.1, from which details of the lectures are also obtainable. Early application is advised.

Salford Mental Health Services

An informal conference to discuss better co-ordination locally of home and hospital services for mental health will be held at the Town Hall, Salford, on July 14 at 2.30 p.m. Dr. Joshua Bierer, of the Institute of Social Psychiatry, London, will speak on individual and social psychiatry, and Dr. J. W. Affleck, of the Leeds Mental Health Services, will also speak.

Speech Therapy

The Eighth International Conference on Speech Therapy will be held in Amsterdam on August 21–26. Particulars may be obtained from the secretary, Dr. Hanny Veldkamp, 27, P.C. Hooftstraat, Amsterdam-Z.

Health Education

The Central Council for Health Education will hold a Summer School at St. Hugh's College, Oxford, on August 14–27. The fee will be 17 guineas. Under the direction of Dr. Robert Sutherland there will be tutorial discussions on health-education principles and methods and the theory of group discussion. Experts will give five lectures, and students will form small groups to exchange experiences from their jobs in youth clubs, schools, clinics, and the home. The school is intended to appeal to educational and medical administrators, doctors, teachers, youth leaders, public health nurses, industrial nurses, welfare workers, training organizers, and students. Further information may be obtained from the medical adviser and secretary, Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1.

Entomology

The Ninth International Congress of Entomology will be held on August 17–24 at Amsterdam. Entomologists wishing to receive in due course the programme and application forms are asked to communicate with the Secretariate, Physiologisch Laboratorium, 136, Rapenburgerstraat, Amsterdam.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Tuesday

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, July 11, 4.30 p.m., *"Some Principles of Antenatal Pathology,"* by Professor R. A. Willis.

Wednesday

CAMBRIDGE UNIVERSITY.—At Addenbrooke's Hospital, Cambridge, July 12, 2.30 p.m., *"The Social Background of Tuberculosis,"* by Dr. W. Paton Philip.

LONDON COUNTY MEDICAL SOCIETY.—At Queen Mary's Hospital, Carshalton, Surrey, July 12, 2.30 p.m., clinical meeting.

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace Road, London, S.W.—July 12, 2.30 p.m., paper: *"The Prevention and Control of the Rheumatic Diseases,"* by Dr. Oswald Savage.

Thursday

EDINBURGH UNIVERSITY.—At Anatomy Lecture Theatre, University New Buildings, July 13, 5 p.m., *"Experimental Studies on the Eye Based upon the Regeneration of the Neural Retina and the Lens,"* Macarthur Postgraduate Lecture by Professor L. S. Stone (Yale University). To be illustrated by coloured films.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, London, S.W.—July 13, 5 p.m., *"The Bearing of Protein Structure on Clinical Problems,"* Bertram Louis Abrahams Lecture by Professor E. C. Dodds, F.R.S.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—July 13, 5 p.m., *"The Diagnosis and Treatment of Acute Deep Venous Thrombosis,"* Surgery Lecture by Dr. Gunnar Bauer (Mariestad Hospital, Sweden).

Friday

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—July 14, 3.45 p.m., *"The Jaws in Generalized Skeletal Disease,"* Charles Tomes Lecture by Professor Lester Cahn (Columbia University); 5 p.m., *"Epulides,"* Charles Tomes Lecture by Professor A. B. P. Amies (University of Melbourne).

ROYAL SANITARY INSTITUTE.—At Great Yarmouth, Norfolk, July 14, 10 a.m., papers: *"The Work of the Public Analyst,"* by Dr. Eric C. Wood, A.R.C.S., F.R.I.C.; *"The Fishing Industry of Great Yarmouth,"* by Mr. G. H. Spinks. Afternoon: visits will be made.

Saturday

●RENAL ASSOCIATION.—At Ciba Foundation, 41, Portland Place, London, W., July 15, 11.30 a.m., *"Development of Modern Renal Physiology,"* by Dr. Homer Smith.

APPOINTMENTS

BAIN, J. W. L., T.D., M.B., Ch.B., D.A., Anaesthetist, Aberdeen General Hospitals and Special Hospitals Groups (Consultant Status).

CRUICKSHANK, ERIC KENNEDY, M.D., M.R.C.P., Professor of Medicine, University College of the West Indies.

DAWSON, MARJORY A., M.B., Ch.B., D.P.H., Assistant County Medical Officer, Assistant School Medical Officer, Medical Officer of Health for Samford and Gipping Rural District Councils and Stowmarket Urban District Council.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—*Consultant Psychiatrist at St. Audry's Mental Hospital*, J. K. Marshall, M.R.C.S., L.R.C.P., D.P.M. *Consultant Anaesthetist (part-time) at County Hospital, Huntingdon*, G. H. W. Keates, M.B., B.S., D.A. *Senior Registrar in Anaesthetics at Norfolk and Norwich Hospital*, A. L. Reynard, M.R.C.S., L.R.C.P., D.A.

SHELLEY, WILLIAM HADFIELD, M.D., D.P.M., Consultant Psychiatrist, Warlingham Park Hospital, Warlingham, Surrey.

SLEIGH, JOHN, M.B., Ch.B., D.P.H., Medical Officer of Health, Andover Municipal Borough and Andover and Kingsclere and Whitchurch Rural Districts, Hampshire.

WIGLEY, GUY SIMPSON, M.R.C.S., L.R.C.P., D.P.H., Deputy County Medical Officer of Health, Middlesex County Council.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Cleobury.—On June 23, 1950, at Bromley, Kent, to Brenda Julie, wife of John Cleobury, M.B., B.S., a son—Nicholas Randall.

Jefferiss.—On June 30, 1950, at Poltimore House Nursing Home, Exeter, to Vivien, wife of Derek Jefferiss, B.M., M.R.C.O.G., a daughter.

DEATHS

Dore.—On June 27, 1950, Samuel Ernest Dore, M.D., F.R.C.P., of London, W.1, and N.W.11.

Gleed.—On June 28, 1950, at 38, Ballard's Lane, Finchley, London, N., Seymour Richard Gleed, M.R.C.S., L.R.C.P., aged 68.

Johnstone.—On June 24, 1950, at Torbeckhill, Lockerbie, Dumfriesshire, George Johnstone, M.B., C.M., late of Middleton, Lancs.

Knapton.—On June 28, 1950, at Oaklands, Lynton, N. Devon, Henry Alfred Forbes Knapton, M.R.C.S., L.R.C.P., Lieutenant-Colonel, I.M.S., retired, aged 80.

Lang.—On June 25, 1950, at Drumassie, Crossford, Lanarks, John McCallum Lang, M.D., D.P.H., aged 60.

Lewers.—On June 26, 1950, at his home, Corinella, Ilfracombe, Hugh Bunnett Lewers, D.S.O., O.B.E., M.B., B.S.

Mann.—On June 29, 1950, at 4, Wellington Circus, Nottingham, Dorothea Jane Mann, M.D.

Mell.—On June 9, 1950, at Broad Green Hospital, Liverpool, Felix Oswald Newton Mell, C.I.E., M.B., C.M., Lieutenant-Colonel, I.M.S., retired, of Mona House, Castletown, Isle of Man, aged 80.

Milne.—On June 24, 1950, at St. Ives, Dorridge, Warwicks, Colin Milne, M.B., Ch.B., D.P.H., aged 57.

Polson.—On June 27, 1950, at Miramar, Milford-on-Sea, Hants, James Ronald Polson, M.D., late of Worcester, aged 91.

Shortall.—On June 15, 1950, at Newry, Co. Down, N. Ireland, Christopher Joseph Shortall M.D., M.Ch., F.R.C.S.I., aged 45.

Thomson.—On June 27, 1950, at 10, Ripon Road, Harrogate, Yorks, Joseph Alexander Thomson, M.B., Ch.B., D.M.R.E.

Ward.—On June 29, 1950, John Forbes Ward, M.D., F.R.C.P., of Deepdene, Manor Road, Cheadle Hulme, Cheshire.

Young.—On June 28, 1950, at Chichester, John Charles Young, M.R.C.S., L.R.C.P., of 43, West Drive, Aldwick, Sussex, aged 78.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Adenoidectomy

Q.—*What are the indications for, and the advantages of, adenoidectomy without tonsillectomy? In a child of 6, with apparently healthy tonsils, would adenoidectomy alone be of any value in preventing recurrent attacks of otitis media, or should it be combined with tonsillectomy? To what other conditions should attention be directed in cases of recurrent otitis media in young children?*

A.—The indications are all troubles caused by enlarged adenoids, such as post-nasal obstruction, with consequent nasal catarrh and often sinusitis; mouth breathing with maldevelopment of the hard palate; and obstruction of the Eustachian tube openings leading to intermittent or chronic infection or catarrh of the middle ear. Sometimes enlarged adenoids interfere with sleep, causing nightmares possibly, and perhaps being related in some cases to nocturnal enuresis. The advantages are that it is such a minor procedure compared with tonsillectomy, and it can, if indicated, be performed on young infants. Tonsils should never be removed unless they are causing trouble, certainly not in the case cited. Other conditions which should be considered in any child with recurrent otitis media are infections of the nasal sinuses, which are shown on *x*-ray examination, and the general lack of resistance caused by bad food and bad housing. Occasionally after adenoidectomy small collections may persist behind the tubal openings, and these may have to be destroyed by radium or *x* rays.

Parkinsonian Rigidity

Q.—*Can you tell me if "myanesin" has been extensively used in the treatment of Parkinson's disease of the predominantly rigid type? What is the usual dosage? Are there any harmful effects resulting from daily administration? What are the advantages, if any, over radiant heat or other palliatives in a fairly advanced case?*

A.—"Myanesin" is an α-substituted glycerol ether and its action is different from that of curare. Curare exerts its effect at the neuromuscular junction, while there is evidence that myanesin acts centrally on the synapses of the spinal cord. Myanesin has been used in an attempt to reduce the rigidity of Parkinson's disease, but no account of a carefully studied series of cases appears to have been published. In the writer's experience with a few cases myanesin by mouth may reduce rigidity, but there tends to be increased muscle weakness and the tremor may become more marked. No harmful effects were caused unless a large dose was given, when the patients complained of double vision and dizziness. The dose of the elixir advised by the makers (B.D.H.) is ½ to 1 drachm (1.8 to 3.5 ml.) from one to six times a day. There is more likely to be a reduction of the Parkinsonian rigidity with a full dosage of one of the solanaceous alkaloids, such as hyoscine or stramonium, or with one of the recently introduced antispasmodics, of which "artane" is often the most efficacious.

Kraurosis Vulvae

Q.—*Have there been any recent advances in the treatment of kraurosis vulvae?*

A.—It depends upon what is meant by kraurosis vulvae. The term should be restricted to a condition of extreme atrophy, with secondary infection, fibrosis, and contracture, occurring after the menopause and related to the cessation of ovarian function. There are no new forms of treatment, but there is an increasing awareness that it is important to be cautious about the diagnosis. In this respect it should be noted that kraurosis is a comparatively rare disease causing pain and dyspareunia. If the symptom is pruritus another cause should be looked for. The disease as it occurs in post-menopausal women responds well to oestrogen therapy, at least temporarily. The difficulty is to discontinue treatment without the condition relapsing. When the skin has become healthy the dose should be gradually reduced, but in some cases intermittent treatment over a prolonged period seems necessary. Local applications of emollient preparations are also helpful.

Anti-gas-gangrene Serum

Q.—*What is the value of anti-gas-gangrene serum?*

A.—Anti-gas-gangrene serum has been employed in both prophylaxis and treatment of this grave infection. The general practice is to use a polyvalent antitoxin against the toxins of *Clostridium welchii, septicum,* and *oedematiens,* the anaerobes most commonly associated with gas gangrene. Opportunities to assess the value of these antitoxins are limited to times of war, since gas gangrene is a rare infection in civilian practice. Towards the end of the 1914–18 war a controlled trial in the prophylaxis of gas gangrene with *Cl. welchii* antitoxin was carried out and gave results which showed that the serum reduced both the incidence and case mortality of the infection. In the 1939–45 war, assessment of the value of gas-gangrene antitoxin, either in the prophylaxis or in the treatment of war wounds, was made difficult by the simultaneous use of chemotherapeutic substances, such as the sulphonamides and, later, penicillin. The available evidence, however, indicated that the case mortality in established gas gangrene was lowered by large doses (50,000 units or more) of polyvalent antitoxin, although the antitoxin was effective only in patients receiving adequate surgical treatment. *Cl. welchii* antitoxin has also been used in the treatment of gangrenous appendicitis, peritonitis, and puerperal infections. It seems likely that penicillin or some other antibiotic will largely replace gas-gangrene antitoxin in the prophylaxis and treatment of infections associated with this group of anaerobes.

Dangerous Drugs Issued to Nurses

Q.—*An instance has occurred where a district nurse has been given a supply of a scheduled drug for administration to a number of patients in accordance with the doctor's instructions, and, owing to the cessation of the treatment for one cause or another, the nurse has been left with a residual supply. By holding a supply the nurse is technically infringing the regulations. Is there any provision in the regulations for the disposal of such excess supplies of dangerous drugs?*

A.—A registered medical practitioner can provide a patient with a supply of a scheduled drug for administration in accordance with his directions either by issuing a prescription to that effect or by handing to the patient, or a competent relative, or a nurse in charge of the patient the scheduled drug he considers appropriate for the treatment of that patient. It is not necessary to enter in the register of supplies particulars of drugs administered to a patient by the doctor personally or by someone acting under the direct personal supervision of the doctor and in his presence. On the other hand, drugs handed to the patient or to the nurse in attendance on the patient for subsequent administration must be recorded in the doctor's register of supplies. An entry must be made on the day on which the drug is supplied or on the following day. Each patient must be considered and recorded separately.

There is no provision in the Dangerous Drugs Regulations for dealing with excess supplies of scheduled drugs that are left over unused after the recovery, removal, or death of the patient. These excess supplies are the property of the patient when they have been provided through the medium of the issue of a prescription; they may be the property of the practitioner when they have been handed over by him out of his personal store of scheduled drugs. In any event, if the practitioner is of opinion, or has reason to believe, that there will be a surplus unused after certain events have occurred, it is only common sense to take suitable steps to recover that surplus from the patient's relatives or the nurse concerned. The regulations are

silent on this point, but clearly the practitioner should take some steps to ensure that the surplus is destroyed or, where desirable, recovered by him and placed in his locked cupboard.

Treatment of Naevus

Q.—*A baby girl, aged about 4 weeks, has a naevus which covers the nose, with small flecks on both upper and lower eyelids on each side. What is the best time to start treatment, and what type of treatment is recommended?*

A.—It is presumed that this is a naevus of the port-wine stain type. Painting with an alcoholic solution of thorium X, 1,500 e.s.u. per ml., once every month or six weeks for, in the first instance, twelve paintings may effect considerable paling of the lesions. The part should be cleaned gently with spirit before painting, and treatment may be started immediately.

Inheritance of Spina Bifida

Q.—*A patient aged 45 has a spina bifida occulta which has never given any trouble, and which was only discovered accidentally in the course of an x-ray examination. The brother of the patient has an only child, aged 7, who has recently undergone an operation for a cerebellar tumour. A first cousin (daughter of the patient's father's sister) has had two children, of whom the first died at the age of 3 months from spina bifida; the second child has survived to the age of 6 with a spina bifida, but cannot walk. The cousin's siblings have produced nine normal children, but the patient's siblings (apart from the brother) have produced none. The patient contemplates matrimony, and wants to know what are the chances of his producing healthy children. Nothing is known of the heredity of the proposed spouse.*

A.—This is rather a difficult question, because the chances for relatives other than brothers and sisters of affected persons are hardly known. Nor is the genetic relation of spina bifida occulta to the manifest condition understood as yet. Nevertheless, on the facts given, the increased risk for any children of this patient is probably very small. It is probably not larger than the one-in-forty chance that any random pregnancy will end in a serious malformation of one kind or another. Hence it seems safe to advise that the patient should ignore the slight added risk implied by a family history of this type.

Prognosis of Primary Syphilis

Q.—*What is the prognosis of primary syphilis with modern treatment? What are the chances (a) of a complete cure, and (b) of being able to produce non-syphilitic children?*

A.—The prognosis of primary syphilis treated by modern methods is extremely favourable, particularly if treatment is started in the sero-negative stage. (*a*) No method of proving biological cure has yet been devised, but presumptive cure, as evaluated by absence of clinical signs and persistently negative serum reactions (including tests of the cerebrospinal fluid) over a period of at least two years after treatment, may be expected in nearly 100% of adequately treated sero-negative primary cases and in 90% or more of sero-positive primary cases. (*b*) Adequate treatment of both males and females should ensure their children being non-syphilitic. Penicillin, which is the treatment of choice for syphilis, has been employed only since 1943, so that some years must elapse before we can be sure that late manifestations such as cardiovascular syphilis and neurosyphilis will not appear; however, provided it is used in optimum dosage, preferably combined with bismuth and perhaps an arsenical, there is every reason to suppose that cure will be obtained in the vast majority of cases.

Treatment of Iritis

Q.—*What mydriatic should be used in the treatment of iritis in a patient of 65 to 70? The tension of the eye is normal.*

A.—In most cases it would be safe to start treatment with ½% atropine twice daily, increasing the strength up to 1% three times a day. If, however, there is some question whether the tension of the eye is raised—and this rise may be due to the iritis—it is better to start with ½% homatropine twice daily. If after twelve hours there is some relief of symptoms, go on to 1% homatropine three times a day. With continued improvement proceed to 1% atropine twice daily, and later three times a day if necessary. The point about using homatropine is that its effect can be overcome fairly quickly by eserine.

Thymus and Growth

Q.—*Can you please tell me of any substances—for example, thymus gland—which may be used to increase growth? I want to try out their effects with exotic fish, which I breed as a hobby.*

A.—Some years ago Rowntree in America reported experiments with extracts of thymus gland which appeared to indicate that growth and development were accelerated through several generations. The effect reported was really an increase in the rate of development, rather than any absolute increase in growth. These experiments have never been repeated with similar results, and it is generally held that they can no longer be sustained as indicating such an action of the thymus gland. The growth hormone of the pituitary gland was originally used with salamanders, a point which might be of interest in connexion with experiments on tropical fish.

NOTES AND COMMENTS

What is a Chill?—Dr. A. V. ADAMS (Heathfield, Sussex) writes: May I request enlightenment about the disturbance of normal physiology underlying the clinical condition—so conspicuously unmentioned in medical literature—known as "a chill"? At sea I have found that a sudden fall in relative atmospheric humidity is followed almost invariably by a high incidence of chills. There may well have been no corresponding fall in atmospheric temperature, and the victim may well have not been exposed to draughts. An especially bad zone for chills is the Gulf of Suez when travelling north from the Red Sea, and I have become a victim myself on all too many occasions, despite the most careful precautions in the direction of avoiding draughts and putting on extra clothing. These chills may take many forms. . . . The diagnostic importance of this syndrome is clearly considerable. If the chill is sudden and severe in onset, as is frequently the case, and if the ship has come from India, both smallpox and the typhoid group immediately call for exclusion. But the problem of differential diagnosis is of obvious enough importance. The problem on which I seek enlightenment is what disturbance of physiology is going on, and what organ or organs are the seat of the disturbance. Can one incriminate a sudden alteration in ionic balance and water metabolism due to environmental changes of similar suddenness and violence, which renal function cannot deal with fast enough? . . . My own view, and I have no evidence to prove it, is that a violent change in *milieu extérieur* produces a concomitant change in *milieu intérieur*, and that it takes a while for the *status quo ante* of the *milieu intérieur* to be restored.

Management of Diverticulosis.—Dr. C. EDWARDS (Bournemouth) writes: I would suggest that one answer to this question is this. Since the removal of roughage from the food affects the quantity to be evacuated, the addition of one of the gel-forming preparations would increase the bulk in the rectum. Instead of the dried scybala (in spite of liquid paraffin) a bulky soft stool is formed, and the paraffin may be reduced and perhaps abandoned.

The "Medical Directory."—The Editor of the *Medical Directory* (104, Gloucester Place, London, W.1) writes: To maintain the accuracy of our annual volume we rely upon the return of our schedule, which has been posted to each member of the medical profession. Should the schedule have been lost or mislaid, we will gladly forward a duplicate upon request. The full name of the doctor should be sent for identification.

Correction.—In the later issues of the *Journal* of June 10 (p. 1351) it was incorrectly stated that Barrowmore Hospital was previously known as "Borrowdale Sanatorium." This should have been "Barrowmore Sanatorium."

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